

/*

* PushPlay -- An Xml Document emulator\interpreter for microprocessors

*

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*

* Arthur Gravina <art@agravina.com>

*

*/

void TableWrite(unsigned char *dest, unsigned char *source, unsigned short Count);

void TableRead(unsigned char *dest, unsigned char *source, unsigned short Count);

```

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 *
 */
#include "support.h"
#ifdef IR_RULES
#ifdef PIC
#include "delay.h"
#include "i2c_ccs.h"
#include "tablereadwrite.h"
#else
#include <io.h>
#include <fcntl.h>
#endif
#include "sendircommon.h"
#include "sendirrules.h"
#include "beep.h"
#ifdef DEBUG
#include <stdio.h>
#endif
#include <string.h>
#include "fsdtablelarge.h"
#include <ctype.h>
short devTicks;
extern short irScriptBuffer;
void ir_initDevice(void)
{
    NodeId nodeDevice;
    char buffer[4];
    fsd_switchRomBuffer(irScriptBuffer);
    nodeDevice = fsd_getRootNode();
    if (nodeDevice != NODE_ERROR) {

        fsd_getAttribute(nodeDevice, "ticks", buffer, 4);
        devTicks = (short)atoi(buffer);
    }
    else {
        devTicks = -1;
    }
    debugHi(("devTicks %d node %d", devTicks, nodeDevice));
    ir_rulesInit();
    fsd_unswitchRomBuffer();
    return;
}
void ir_LedOn(const unsigned short T)
{

```

```

#ifdef PIC
    IR_LED_ON;
    DelayBigUs(T);
#endif
#ifdef IR_RULES
    IR_LED_OFF;
#endif
#endif
}

void ir_LedOff(const unsigned short T)
{
#ifdef PIC
#ifdef IR_RULES
    IR_LED_OFF;
#endif

    DelayBigUs(T);
#endif
}

void ir_Initialize(void)
{
    struct eprom_script_def script;
    short scriptType, scriptId;
    devTicks = -1;
    scriptType = IRSCRIPT;
    if (epromValid() ) {
        scriptId = epromReadWord(EEPROM_IR_SCRIPTID);
    }
    else {
        scriptId = -1;
    }
    if (scriptId != -1) {
        if (epromGetScript(scriptType, scriptId, &script) == -1) {
            fsd_setScriptBuffer(scriptType, scriptId);
        } else {
            fsd_setScriptBufferNoLoad(&script);
        }
    }

    ir_initDevice();
    if (devTicks == 0) devTicks = -1;
#ifdef IR_RULES
    if (devTicks != -1) {

        fsd_switchRomBuffer(irScriptBuffer);

        if (epromGetScript(IRDATA, -1, &script) == -1) {
            ir_configIrCodes();
        }
        else {

```

```

    ir_configIrCodesRom();
}
fsd_setMainScriptBuffer();
}
#endif
}
if (devTicks == -1) {
    errorBeep();
    debugPutstrHi("No ir device");
}
}
long ir_CalcFrequency(const short N)
{
    long ret;
    ret = (long)(PRONTOFREQUENCY/(103 * (float).241246));
    return ret;
}
short ir_CalcOneCycle(const long frequency)
{
    float x;
    short ret;
    x = ((float)1 / frequency);
    x += (float).0000005;
    ret = (short)(x * 1000000L);
    return ret;
}
#endif

```

```

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 */
#include <pic18.h>
#include "delay.h"
#ifdef DEBUG
#include "serial.h"
#include <stdio.h>
#endif
#include <string.h>
#include "i2c_ccs.h"
short ROM_ReadWord(int address)
{
    short ret;
    random_readM(0x00, address, (char *)&ret, 2);
    return ret;
}
void ROM_Send(int Address, char *Data, char Num)
{
    while(Num--)
    {
        random_write(0x00, Address, *Data);
        Data++;
        Address++;
    }
}
void ROM_Read(int Address, void *Data, char Num)
{
    random_readM(0x00, Address, Data, Num);
}
void random_write(char dev_adr, int mem_adr, char dat)
{
    i2c_start();
    i2c_out_byte(0xa0 | (dev_adr << 1));
    i2c_nack();
    i2c_out_byte((mem_adr >> 8) & 0xff);
    i2c_nack();
    i2c_out_byte(mem_adr & 0xff);
    i2c_nack();
    i2c_out_byte(dat);
    i2c_nack();
    i2c_stop();
    DelayMs(25);
}
void random_readM(char dev_adr, int mem_adr, void *Data, char Num)

```

```

{
    char i;
    char *p=Data;
    i2c_start();
    i2c_out_byte(0xa0 | (dev_adr << 1));
    i2c_nack();
    i2c_out_byte((mem_adr >> 8) & 0xff);
    i2c_nack();
    i2c_out_byte(mem_adr & 0xff);
    i2c_nack();
    i2c_start();
    i2c_out_byte(0xa1 | (dev_adr << 1));
    i2c_nack();
    for (i=0; i < Num; i++) {
        *p++=i2c_in_byte();
        if (i != Num - 1) {
            i2c_ack();
        }
    }
    i2c_stop();
}

char random_read(char dev_adr, int mem_adr)
{
    char y;
    i2c_start();
    i2c_out_byte(0xa0 | (dev_adr << 1));
    i2c_nack();
    i2c_out_byte((mem_adr >> 8) & 0xff);
    i2c_nack();
    i2c_out_byte(mem_adr & 0xff);
    i2c_nack();
    i2c_start();
    i2c_out_byte(0xa1 | (dev_adr << 1));
    i2c_nack();
    y=i2c_in_byte();
    i2c_stop();
    return(y);
}

char i2c_in_byte(void)
{
    char i_byte, n;
    i2c_high_sda();
    for (n=0; n<8; n++)
    {
        i2c_high_scl();
        if (SDA_PIN)
        {
            i_byte = (i_byte << 1) | 0x01;
        }
        else

```

```

    {
        i_byte = i_byte << 1;
    }
    i2c_low_scl();
}
return(i_byte);
}
void i2c_out_byte(char o_byte)
{
    char n;
    for(n=0; n<8; n++)
    {
        if(o_byte&0x80)
        {
            i2c_high_sda();
        }
        else
        {
            i2c_low_sda();
        }
        i2c_high_scl();
        i2c_low_scl();
        o_byte = o_byte << 1;
    }
    i2c_high_sda();
}
void i2c_nack(void)
{
    i2c_high_sda();
    i2c_high_scl();
    i2c_low_scl();
}
void i2c_ack(void)
{
    i2c_low_sda();
    i2c_high_scl();
    i2c_low_scl();
    i2c_high_sda();
}
void i2c_start(void)
{
    i2c_low_scl();
    i2c_high_sda();
    i2c_high_scl();
    i2c_low_sda();
    i2c_low_scl();
}
void i2c_stop(void)
{
    i2c_low_scl();

```

```
i2c_low_sda();
i2c_high_scl();
i2c_high_sda();
}
void i2c_high_sda(void)
{
    SDA_DIR = 1;
}
void i2c_low_sda(void)
{
    SDA_PIN = 0;
    SDA_DIR = 0;
}
void i2c_high_scl(void)
{
    SCL_DIR = 1;
}
void i2c_low_scl(void)
{
    SCL_PIN = 0;
    SCL_DIR = 0;
}
```


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'
'

VERSION 5.00

Begin VB.Form Form1

 Caption = "Compile Ir Codes"

 ClientHeight = 7095

 ClientLeft = 60

 ClientTop = 450

 ClientWidth = 10185

 LinkTopic = "Form1"

 ScaleHeight = 7095

 ScaleWidth = 10185

 StartPosition = 3

Begin VB.CommandButton cmdCompile

 Caption = "Compile"

 Height = 495

 Left = 7920

 TabIndex = 4

 Top = 720

 Width = 2055

End

Begin VB.DriveListBox drvList

 Height = 315

 Left = 120

 TabIndex = 3

 Top = 360

 Width = 3495

End

Begin VB.DirListBox dirList

 Height = 2790

 Left = 120

 TabIndex = 2

 Top = 1080

 Width = 3495

End

Begin VB.FileListBox filList

 Height = 3405

 Left = 4080

 MultiSelect = 1

 TabIndex = 1

 Top = 360

 Width = 3255

End

Begin VB.ListBox List1

 Height = 1815

 Left = 360

```

    TabIndex    = 0
    Top         = 4800
    Width       = 7695
End
End
Attribute VB_Name = "Form1"
Attribute VB_GlobalNameSpace = False
Attribute VB_Creatable = False
Attribute VB_PredeclaredId = True
Attribute VB_Exposed = False
Option Explicit
Private WithEvents oCompiler As FSDCompileScript
Attribute oCompiler.VB_VarHelpID = -1
Private Sub cmdCompile_Click()
    compileFiles
End Sub
Private Sub dirList_Change()
    filList.Path = dirList.Path
End Sub
Private Sub Form_Load()
    Form1.Show
    filList.Pattern = "*.xml"
End Sub
Sub compileFiles()
    Dim inFilename As String, mypath As String, outFilename As String
    Dim ret As Integer
    Dim errors As String
    Dim ind As Integer
    On Error GoTo errrtn
    Set oCompiler = New FSDCompileScript
    If filList.ListCount Then
        mypath = dirList.Path + "\"
        For ind = 0 To Form1!filList.ListCount - 1
            inFilename = Form1!filList.List(ind)
            outFilename = Left(inFilename, Len(inFilename) - 4)
            outFilename = outFilename & ".fsd"
            List1.AddItem "compiling.. " & inFilename
            ret = oCompiler.fsd_loadScript(mypath & inFilename, errors)
            If ret = False Then
                MsgBox errors, vbCritical, "compileCodes WARNING!"
                GoTo errrtn
            End If
            oCompiler.fsd_Compile mypath & outFilename
        Next ind
    End If
    Exit Sub
errrtn:
    MsgBox "compileFiles Error: " & Error
End Sub
Sub compileIrFiles()

```

```

Dim inFilename As String, mypath As String, outFilename As String
Dim ret As Integer
Dim errors As String
On Error GoTo errrtn
Set oCompiler = New FSDCompileScript
mypath = "c:\smarttoy\compile ir codes\"
inFilename = Dir(mypath & "*.xml")
Do While inFilename <> ""
    List1.AddItem "loadscript.. " & inFilename
    outFilename = Left(inFilename, Len(inFilename) - 4)
    outFilename = outFilename & ".fsd"
    ret = oCompiler.fsd_loadScript(mypath & inFilename, errors)
    If ret = False Then
        MsgBox errors, vbCritical, "compileIrCodes WARNING!"
        GoTo errrtn
    End If
    oCompiler.fsd_Compile mypath & outFilename
    inFilename = Dir
Loop
Exit Sub
errrtn:
    MsgBox "compileIrFiles Error: " & Error
End Sub
Sub compileIrFilesOld()
    Dim fileName As String, mypath As String
    Dim ret As Integer
    Dim errors As String
    On Error GoTo errrtn
    Set oCompiler = New FSDCompileScript
    mypath = "c:\smarttoy\compile ir codes\"
    fileName = mypath & "irCodes.xml"
    List1.AddItem "loadscript.. " & fileName
    ret = oCompiler.fsd_loadScript(fileName, errors)
    oCompiler.fsd_Compile mypath & "irCodes.fsd"
    If ret = False Then
        MsgBox errors, vbCritical, "compileIrCodes WARNING!"
        GoTo errrtn
    End If
errrtn:
End Sub
Private Sub oCompiler_info(sMsg As String)
End Sub
Private Sub info(msg As String)
    Dim obuf As String
    obuf = msg & " " & Now
    List1.AddItem obuf
    List1.ListIndex = List1.ListCount - 1
End Sub

```

```
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 *
 */
#ifndef __istack_h_
#define __istack_h_
#define MAXDIM 20
#define ISTKERROR -3333
typedef short ElementType;
void IPush(const ElementType f);
ElementType IPop(void);
ElementType IPeek(const ElementType Item);
short ICount();
void EmptyIStack(void);
#endif
```

```

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 *
 */
#include "support.h"
#ifdef IR_RULES
#include "fsdtablelarge.h"
#include "sendircommon.h"
#include "sendirrules.h"
#endif
#include "pcromchip.h"
#endif

static void defineButton(struct ir_remote*remote, struct ir_ncode *codes, const char *commandName, NodeId
buttonNode);
extern short offsetFlashMemory;
extern short numScriptBuffers;
extern unsigned short scriptBuffer[];
extern short offsetFlashMemory;
static struct ir_remote remote;
const struct flaglist all_flags[] = {
{"RC5", RC5_CODE},
{"RC6", RC6_CODE},
{"RCMM", RCMM},
{"SHIFT_ENC", SHIFT_ENC},
{"SPACE_ENC", SPACE_ENC},
{"REVERSE", REVERSE},
{"NO_HEAD_REP", NO_HEAD_REP},
{"NO_FOOT_REP", NO_FOOT_REP},
{"CONST_LENGTH",CONST_LENGTH},
{"RAW_CODES", RAW_CODES},
{"REPEAT_HEADER", REPEAT_HEADER},
{"SPECIAL_TRANSMITTER", SPECIAL_TRANSMITTER},
{NULL,0},
};
const struct flaglist allCommands[] = {
{"TITLE", TITLE},
{"MENU", MENU},
{"PLAY", PLAY},
{"STOP", STOPDVD},
{"PAUSE", PAUSE},
{"STEP", STEP},
{"PREVCHAPTER", PREVCHAPTER},
{"NEXTCHAPTER", NEXTCHAPTER},
{"SEARCH", SEARCH},
{"NAV_UP", NAV_UP},
{"NAV_DOWN", NAV_DOWN},

```

```

{"NAV_LEFT", NAV_LEFT},
{"NAV_RIGHT", NAV_RIGHT},
{"REWIND", REWIND},
{"FORWARD", FORWARD},
{"NUM_1", NUM_1},
{"NUM_2", NUM_2},
{"NUM_3", NUM_3},
{"NUM_4", NUM_4},
{"NUM_5", NUM_5},
{"NUM_6", NUM_6},
{"NUM_7", NUM_7},
{"NUM_8", NUM_8},
{"NUM_9", NUM_9},
{"NUM_0", NUM_0},
{"NUM_TEN_PLUS", NUM_TEN_PLUS},
{"POWER", POWER},
{NULL, 0},
};
static int parseFlags(char *val)
{
    const struct flaglist *flaglptr;
    int flags=0;
    char *flag,*help;

    flag=help=val;
    while(flag!=NULL)
    {
        while(*help!='|' && *help!=0) help++;
        if(*help=='|')
        {
            *help=0;help++;
        }
        else
        {
            help=NULL;
        }
        flaglptr=all_flags;
        while(flaglptr->name!=NULL){
            if(strcmp(flaglptr->name,flag)==0){
                flags=flags|flaglptr->flag;
                break;
            }
            flaglptr++;
        }
        if(flaglptr->name==NULL)
        {
            return(0);
        }
        flag=help;
    }
}

```

```

        return(flags);
    }
    unsigned char ir_lookupButton(const char *buttonName)
    {
        const struct flaglist *flaglptr;
        unsigned char command;
        command = 255;
        flaglptr=allCommands;
        while(flaglptr->name!=NULL){
            if(strncasecmp(flaglptr->name, buttonName)==0){
                command= flaglptr->flag;
                break;
            }
            flaglptr++;
        }
        return command;
    }
    static void defineButton(struct ir_remote*remote, struct ir_ncode *codes, const char *commandName, NodeId
buttonNode)
    {
        char temp[24];
        unsigned char command;

        command = ir_lookupButton(commandName);
        if (command == 255) {
            debugHi(("Bad Button: %s", commandName));
            return;
        }
        ir_initWords(command);
        fsd_getAttribute(buttonNode, "value", temp, 24);
        ir_code_init(&codes->code);
        ir_strtocode(temp, 1, (char)remote->bits, &codes->code);
        send(codes, remote, (unsigned short)remote->min_repeat);
        ir_endWords(command);
    }
    static void defineRemote(char * key, NodeId ruleNode, struct ir_remote *rem)
    {
        char temp[24];
        if ((strncasecmp("bits",key))==0){
            fsd_getAttribute(ruleNode, "value", temp, 24);
            rem->bits=atoi(temp);
        }
        else if (strncasecmp("flags",key)==0){
            fsd_getAttribute(ruleNode, "value", temp, 24);
            rem->flags|=parseFlags(temp);
        }
    }

```

```

else if (strncasecmp("header",key)==0){
    fsd_getAttribute(ruleNode, "pulse", temp, 24);
    rem->phead=atoi(temp);
    fsd_getAttribute(ruleNode, "space", temp, 24);
    rem->shead=atoi(temp);
}
else if (strncasecmp("one",key)==0){
    fsd_getAttribute(ruleNode, "pulse", temp, 24);
    rem->pone=atoi(temp);
    fsd_getAttribute(ruleNode, "space", temp, 24);
    rem->sone=atoi(temp);
}
else if (strncasecmp("zero",key)==0){
    fsd_getAttribute(ruleNode, "pulse", temp, 24);
    rem->pzero=atoi(temp);
    fsd_getAttribute(ruleNode, "space", temp, 24);
    rem->szero=atoi(temp);
}

else if (strncasecmp("plead",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->plead=atoi(temp);
}

else if (strncasecmp("ptrail",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->ptrail=atoi(temp);
}

else if (strncasecmp("foot",key)==0){
    fsd_getAttribute(ruleNode, "pulse", temp, 24);
    rem->pfoot=atoi(temp);
    fsd_getAttribute(ruleNode, "space", temp, 24);
    rem->sfoot=atoi(temp);
}

else if (strncasecmp("repeat",key)==0){
    fsd_getAttribute(ruleNode, "prepeat", temp, 24);
    rem->prepeat=atoi(temp);
    fsd_getAttribute(ruleNode, "srepeat", temp, 24);
    rem->srepeat=atoi(temp);
}

else if (strncasecmp("pre_data_bits",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->pre_data_bits=atoi(temp);
}

```



```

else if (strncasecmp("pre_data",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    ir_strtocode(temp, 1, (char)rem->pre_data_bits, &rem->pre_data);
}

else if (strncasecmp("post_data_bits",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->post_data_bits=atoi(temp);
}

else if (strncasecmp("post_data",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    ir_strtocode(temp, 1, (char)rem->post_data_bits, &rem->post_data);
}

else if (strncasecmp("pre",key)==0){
    fsd_getAttribute(ruleNode, "ppre", temp, 24);
    rem->pre_p=atoi(temp);
    fsd_getAttribute(ruleNode, "spre", temp, 24);
    rem->pre_s=atoi(temp);
}

else if (strncasecmp("post",key)==0){
    fsd_getAttribute(ruleNode, "ppost", temp, 24);
    rem->post_p=atoi(temp);
    fsd_getAttribute(ruleNode, "spost", temp, 24);
    rem->post_s=atoi(temp);
}

else if (strncasecmp("gap",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->gap=atol(temp);
}

else if (strncasecmp("repeat_gap",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->repeat_gap=atol(temp);
}

else if (strncasecmp("toggle_bit",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->toggle_bit=atoi(temp);
}

else if (strncasecmp("min_repeat",key)==0){

```

```

fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->min_repeat=atoi(temp);
}

else if (strncasecmp("frequency",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->freq=atoi(temp);
}

else if (strncasecmp("duty_cycle",key)==0){
    fsd_getAttribute(ruleNode, "value", temp, 24);
    rem->duty_cycle=atoi(temp);
}else{
    debugPutstrHi(("Error config:"));
    debugPutstrHi((key));
}
}

void ir_configIrCodesRom(void)
{
    struct eprom_script_def script;
    short beginRombuffer, numBytes;

    if (epromGetScript(IRDATA, -1, &script) != -1) {
        beginRombuffer = script.location;
        numBytes = script.len;
        ir_initPointersFromRom(beginRombuffer, numBytes);
        debugHi(("irRom = %d %d", beginRombuffer, numBytes));
    }
    else {
        debugPutstrHi(("find IRDATA in eprom failed"));
    }
}

void ir_configIrCodes(void)
{
    struct ir_ncode codes;
    NodeId parentNode;
    NodeId ruleNode;
    NodeId buttonNode;
    char temp[24];
    struct eprom_script_def epromScript;
    short beginRomBuffer, thisRomBuffer;
    short numBytes;

    memset((char *)&remote, 0, sizeof(remote));
    beginRomBuffer = irdataOffset;
    parentNode = fsdint_findButton(NODE_ROOT, "rules", NULL);
    debugPutstrHi(("compile rules"));
    ruleNode = fsd_fetchNodeId(parentNode,FIRSTCHILD);

```

```

    while (!(ruleNode == NODE_EMPTY || ruleNode == NODE_ERROR) ) {
fsd_getNodeName(ruleNode, temp, 24);
defineRemote(temp, ruleNode, &remote);
debugHi(("node %s", temp));
    ruleNode = fsd_fetchNodeId(ruleNode, NEXTNODE);
    }

debugPutstrHi(("compile buttons"));
parentNode = fsdint_findButton(NODE_ROOT, "buttons", NULL);
    buttonNode = fsd_fetchNodeId(parentNode, FIRSTCHILD);
    while (!(buttonNode == NODE_EMPTY || buttonNode == NODE_ERROR) ) {
fsd_getNodeName(buttonNode, temp, 24);
defineButton(&remote, &codes, temp, buttonNode);
debugHi(("node %s", temp));
    buttonNode = fsd_fetchNodeId(buttonNode, NEXTNODE);
    }
numBytes = irdataOffset - beginRomBuffer - 1;
thisRomBuffer = numScriptBuffers;
debug(("IRDATA Script %d %d", beginRomBuffer, numBytes ));
scriptBuffer[thisRomBuffer] = beginRomBuffer;
numScriptBuffers++;

epromScript.id = -1;
epromScript.location = beginRomBuffer;
epromScript.type = IRDATA;
epromScript.len = numBytes;
epromWriteScriptNumber(thisRomBuffer, &epromScript);
#ifdef PIC

    pc_writeFlash(beginRomBuffer, numBytes);
#endif
}

static void defineRemoteTest(struct ir_remote *rem)
{
    char temp[32];

    rem->bits=16;

    rem->flags = SPACE_ENC | REVERSE;

    rem->phead=8800;
    rem->shead=4400;

    rem->pone=550;
    rem->sone=1650;

    rem->pzero=550;
    rem->szero=550;

    rem->plead=0;

```

```
rem->ptrail=550;
```

```
rem->pfoot=0;
```

```
rem->sfoot=0;
```

```
rem->prepeat=8800;
```

```
rem->srepeat=2200;
```

```
rem->pre_data_bits=16;
```

```
strcpy(temp, "0xCD72");
```

```
ir_strtocode(temp, 1, (char)rem->pre_data_bits, &rem->pre_data);
```

```
rem->post_data_bits=0;
```

```
strcpy(temp, "");
```

```
ir_strtocode(temp, 1, (char)rem->post_data_bits, &rem->post_data);
```

```
rem->pre_p=0;
```

```
rem->pre_s=0;
```

```
rem->post_p=0;
```

```
rem->post_s=0;
```

```
rem->gap=38500;
```

```
rem->repeat_gap=0L;
```

```
rem->toggle_bit=0;
```

```
rem->min_repeat=0;
```

```
rem->freq=0;
```

```
rem->duty_cycle=0;
```

```
}
```

```
static void defineButtonTest(struct ir_remote*remote, struct ir_ncode *codes, const char *commandName, const char *value)
```

```
{
```

```
char temp[24];
```

```
unsigned char command;
```

```
debug(("TestButton: %s %s", commandName, value));
```

```

strcpy(temp, value);
command = ir_lookupButton(commandName);
if (command == 255) {
    debugHi(("Bad Button: %s", commandName));
    return;
}
ir_initWords(command);
ir_code_init(&codes->code);
ir_strtocode(temp, 1, (char)remote->bits, &codes->code);
send(codes, remote, (unsigned short)remote->min_repeat);
ir_endWords(command);
}
void ir_configTest(void)
{
    struct ir_ncode codes;

    memset((char *)&remote, 0, sizeof(remote));
    debugPutstrHi(("compile Test rules"));
    defineRemoteTest(&remote);

    debugPutstrHi(("compile Test buttons"));
    defineButtonTest(&remote, &codes, "PLAY", "0xE718");
    defineButtonTest(&remote, &codes, "STOP", "0xE619");
}
#endif

```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#ifdef IR_RULES
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "fsdtablelarge.h"
#include "sendirrules.h"
#include "sendircommon.h"
#ifdef PIC
#include "tablereadwrite.h"
#include "delay.h"
#else
#include "pcromchip.h"
#endif
struct ir_remote *repeat_remote=NULL;
struct ir_ncode *repeat_code=NULL;
extern const unsigned char *flashMemory;
extern short offsetFlashMemory;
extern short irScriptBuffer;
extern short currentScriptBuffer;
extern short numScriptBuffers;
extern unsigned short scriptBuffer[];
#define MAXIRDATA 10000
unsigned short irPointers[MAXIRCOMMAND];
short currIrCommandLength;
static short irmacros[MAXIRMACRO+1];
void ir_rulesInit(void)
{
    short i;

    for (i=0; i < MAXIRMACRO+1; i++) {
        irmacros[i] = NODE_ERROR;
    }
    for (i=0; i < MAXIRCOMMAND; i++) {
        irPointers[i] = -1;
    }
}

NodeId ir_findMacro(short butNumber, const char *butName)
{
    NodeId butLoc;
    fsd_switchRomBuffer(irScriptBuffer);
    if (butNumber >= 0 && butNumber <= MAXIRMACRO) {

```

```

if ( irmacros[butNumber] == NODE_ERROR) {
    butLoc = fsdint_findButton(NODE_ROOT, "IrMacro", butName);
    irmacros[butNumber] = butLoc;
}
else {
    butLoc = irmacros[butNumber];
}
}
if (butLoc != NODE_ERROR) {
    butLoc = fsdint_formBufferNode(butLoc);
}
fsd_unswitchRomBuffer();
return butLoc;
}

void ir_initWords(unsigned char command)
{
    if (command > MAXIRCOMMAND - 1) return;
    debug(("Command: %d at %d", command, irdataOffset));
    currIrCommandLength = 0;
    ir_addWord(0, command);
    ir_addWord(0, 0);
    irPointers[command] = irdataOffset;
}

void ir_addWord(char flag, unsigned long word)
{
    unsigned short newWord;
    do {
        if (word > 0x7ffe) {
            newWord = 0x7ffe;
        }
        else {
            newWord = (unsigned short)word;
        }
        word -= newWord;
        if (flag) newWord |= 0x8000;
        if (irdataOffset < MAXIRDATA) {
#ifdef PIC
            TableWrite((unsigned char *)&flashMemory[irdataOffset], (unsigned char *)&newWord, sizeof(unsigned short));
#else
            memcpy((unsigned char *)&flashMemory[irdataOffset], &newWord, sizeof(unsigned short));
#endif
        }
        irdataOffset += sizeof(unsigned short);
        currIrCommandLength += sizeof(unsigned short);
    } while (word > 0);
}

void ir_endWords(unsigned char command)
{
    unsigned short newWord;
    short offset;

```

```

offset = irPointers[command];
offset -= sizeof(unsigned short);

newWord = currIrCommandLength - (2 * sizeof(unsigned short));
if (irdataOffset < MAXIRDATA) {
#ifdef PIC
    TableWrite((unsigned char *)&flashMemory[offset], (unsigned char *)&newWord, sizeof(unsigned short));
#else
    memcpy((unsigned char *)&flashMemory[offset], &newWord, sizeof(unsigned short));
#endif
}
}

void ir_sendWords(unsigned char command)
{
    short address;
    unsigned short word;
    short length, i;
    if (command > MAXIRCOMMAND - 1) return;

    address = irPointers[command];
    if (address == -1) return;
    memcpy(&length, flashMemory+(long)address-sizeof(unsigned short), 2);
#ifdef PIC
    di();
#endif
    for (i = 0; i < length; i+=2) {
        memcpy(&word, flashMemory+(long)address, 2);
        if (word == 0xffff) break;
        if (word & 0x8000) {
            ir_LedOn((unsigned short)(word & 0x7fff));
        }
        else {
            ir_LedOff(word);
        }
        address += 2;
    }
#ifdef PIC
    ei();
#endif
}

void ir_initPointersFromRom(short address, short len)
{
    short offset = address;
    short command, length;
#ifdef PIC

    pc_readFlash(offset, len);
#endif

    while(offset < address + len) {

```



```

memcpy(&command, &flashMemory[offset], 2);
offset += 2;
memcpy(&length, &flashMemory[offset], 2);
offset += 2;
irPointers[command] = offset;
offset += length;
}
offsetFlashMemory = address;
currentScriptBuffer = numScriptBuffers;
numScriptBuffers++;

scriptBuffer[currentScriptBuffer] = offsetFlashMemory;
offsetFlashMemory += len;
}
void ir_sendNumbersString(const char *sNum)
{
    short i, len;
    char sNumber;

    len = strlen(sNum);
    for (i = 0; i < len; i++) {
        sNumber = *sNum++;
        sNumber -= '0';
        switch (sNumber) {
            case 0:
                ir_sendWords(NUM_0);
                break;
            case 1:
                ir_sendWords(NUM_1);
                break;
            case 2:
                ir_sendWords(NUM_2);
                break;
            case 3:
                ir_sendWords(NUM_3);
                break;
            case 4:
                ir_sendWords(NUM_4);
                break;
            case 5:
                ir_sendWords(NUM_5);
                break;
            case 6:
                ir_sendWords(NUM_6);
                break;
            case 7:
                ir_sendWords(NUM_7);
                break;
            case 8:
                ir_sendWords(NUM_8);

```

```

    break;
    case 9:
        ir_sendWords(NUM_9);
    break;
}
#ifdef PIC
#endif
}
static char is_biphase(struct ir_remote *remote)
{
    if(remote && (remote->flags&RC5_CODE || remote->flags&RC6_CODE)) return(1);
    else return(0);
}
static char is_rc6(struct ir_remote *remote)
{
    if(remote && remote->flags&RC6_CODE) return(1);
    else return(0);
}
static char is_rcmm(struct ir_remote *remote)
{
    if(remote && remote->flags&RCMM) return(1);
    else return(0);
}
static char is_raw(struct ir_remote *remote)
{
    if(remote && remote->flags&RAW_CODES) return(1);
    else return(0);
}
static char is_const(struct ir_remote *remote)
{
    if(remote && remote->flags & CONST_LENGTH) return(1);
    else return(0);
}
static char has_header(struct ir_remote *remote)
{
    if(remote && remote->phead>0 && remote->shead>0) return(1);
    else return(0);
}
static char has_foot(struct ir_remote *remote)
{
    if(remote && remote->pfoot>0 && remote->sfoot>0) return(1);
    else return(0);
}
static char has_repeat(struct ir_remote *remote)
{
    if(remote && remote->prepeat>0 && remote->srepeat>0) return(1);
    else return(0);
}
static char has_repeat_gap(struct ir_remote *remote)

```

```

{
    if(remote && remote->repeat_gap>0) return(1);
    else return(0);
}
static char has_pre(struct ir_remote *remote)
{
    if(remote && remote->pre_data_bits>0) return(1);
    else return(0);
}
static char has_post(struct ir_remote *remote)
{
    if(remote && remote->post_data_bits>0) return(1);
    else return(0);
}
unsigned long s_strtoul(char *val, char **endptr, char base)
{
    unsigned long result=0;
    unsigned char c;
    while(*val=='\t' || *val==' ') val++;
    if(base==0)
        if(val[0]=='0')
            if(val[1]=='x' || val[1]=='X')
            {
                base=16;
                val+=2;
            }
        else
        {
            val++;
            base=8;
        }
    else
        base=10;

    while(1)
    {
        c = *val;
        if(c >= '0' && c <= '9') c = c - '0';
        else if(c >= 'a' && c <= 'f') c = (c - 'a') + 10;
        else if(c >= 'A' && c <= 'F') c = (c - 'A') + 10;
        else break;
        result *= base;
        result += c;
        val++;
    }
    *endptr=val;
    return result;
}
void send_space(unsigned long length)
{

```

```

    ir_addWord(0, length);
}
void send_pulse(unsigned long length)
{

    ir_addWord(1, length);

}
void ir_strtocode(char *val, char which, char numBits, ir_code *code)
{
    unsigned long value;
    char *endptr;
    value = s_strtoul(val,&endptr,0);
    if(strlen(endptr)!=0 || strlen(val)==0)
    {
        code->data[which] = 0;
        code->bits[which] = 0;
        return;
    }
    code->data[which] = value;
    code->bits[which] = numBits;
    return;
}
void ir_code_init(ir_code *code)
{
    char i;
    for (i=0; i < IR_CODE_LENGTH; i++) {
        code->data[i] = 0;
        code->bits[i] = 0;
    }
}
static char ir_code_hasData(ir_code *code)
{
    char i;
    for (i=0; i < IR_CODE_LENGTH; i++) {
        if (!(code->bits[i] == 0)) return 1;
    }
    return 0;
}
void ir_send_data_long(unsigned long value, char bits)
{
    while(bits-- > 0) {
        if (value & 1) {

        }
        else {

        }
    }
}

```

```

    value = value >> 1;
}
}

void ir_set_bit(ir_code *code, short bitnum, char data)
{
    short which=IR_CODE_LENGTH-1;
    short whichBit=bitnum;
    char totalBits=0;
    if ((short)bitnum < 0) return;

    for (which=IR_CODE_LENGTH-1; which >=0; which--) {
        totalBits += code->bits[which];
        if (bitnum < totalBits ) {

            code->data[which] &= ~(1 << whichBit);
            code->data[which] |= (data ? 1:0) << whichBit;
            break;
        }
        whichBit -= code->bits[which];
    }
}

char ir_get_bit(ir_code *code, short bitnum)
{
    short which=IR_CODE_LENGTH-1;
    short whichBit=bitnum;
    char totalBits=0;
    if (bitnum < 0) return 0;

    for (which=IR_CODE_LENGTH-1; which >=0; which--) {
        totalBits += code->bits[which];
        if (bitnum < totalBits ) {

            if (code->data[which] & (1 << whichBit) ) {
                return 1;
            }
            else {
                return 0;
            }
        }
        whichBit -= code->bits[which];
    }
    return 0;
}

void ir_reverse(ir_code *inCode, ir_code *outCode)
{
    char i, sourceBit, bitnum;
    char destBit;
    char totalBits=0;

```

```

ir_code_init(outCode);
for(i=0; i < IR_CODE_LENGTH; i++) {
    totalBits += inCode->bits[i];
    outCode->bits[i] = inCode->bits[i];
}

destBit = totalBits-1;
for(sourceBit=0; sourceBit < totalBits; sourceBit++)
{
    bitnum = ir_get_bit(inCode, sourceBit);

    if (bitnum) {
        ir_set_bit(outCode, destBit, bitnum);
    }

    destBit--;
}

}

void send_header(struct ir_remote *remote)
{
    if(has_header(remote))
    {

        send_pulse(remote->phead);
        send_space(remote->shead);
    }
}

void send_foot(struct ir_remote *remote)
{
    if(has_foot(remote))
    {

        send_space(remote->sfoot);
        send_pulse(remote->pfoot);
    }
}

void send_lead(struct ir_remote *remote)
{
    if(remote->plead!=0)
    {

        send_pulse(remote->plead);
    }
}

void send_trail(struct ir_remote *remote)
{
    if(remote->ptrail!=0)
    {

```

```

    send_pulse(remote->ptrail);
}
}
void send_data(struct ir_remote *remote, ir_code *inData, int bits)
{
    char i;
    ir_code data;

    if(!(remote->flags&REVERSE)) {
        ir_reverse(inData, &data);
    }
    else {
        memcpy(&data, inData, sizeof(data));
    }
    for(i=0;i<bits;i++)
    {
        if(ir_get_bit(&data, i))
        {

            if(is_biphase(remote))
            {
                if(is_rc6(remote) && i+1==remote->toggle_bit)
                {
                    send_space(2*remote->sone);
                    send_pulse(2*remote->pone);
                }
                else
                {
                    send_space(remote->sone);
                    send_pulse(remote->pone);
                }
            }
            else
            {
                send_pulse(remote->pone);
                send_space(remote->sone);
            }
        }
        else
        {

            if(is_rc6(remote) && i+1==remote->toggle_bit)
            {
                send_pulse(2*remote->pzero);
                send_space(2*remote->szero);
            }
            else
            {
                send_pulse(remote->pzero);

```

```

    send_space(remote->szero);
}
}
}
}
void send_pre(struct ir_remote *remote)
{
    ir_code pre;
    if(has_pre(remote))
    {

        memcpy(&pre, &remote->pre_data, sizeof(pre));
        if(remote->toggle_bit>0)
        {
            if(remote->toggle_bit<=remote->pre_data_bits)
            {
                ir_set_bit(&pre,
                    (char)(remote->pre_data_bits - remote->toggle_bit),
                    (char)remote->repeat_state);
            }
        }
        if (ir_code_hasData(&pre)) {
            send_data(remote, &pre, remote->pre_data_bits);
        }
        if(remote->pre_p>0 && remote->pre_s>0)
        {
            send_pulse(remote->pre_p);
            send_space(remote->pre_s);
        }
    }
}
void send_post(struct ir_remote *remote)
{
    if(has_post(remote))
    {
        ir_code post;

        memcpy(&post, &remote->post_data, sizeof(post));
        if(remote->toggle_bit>0)
        {
            if(remote->toggle_bit>remote->pre_data_bits
                +remote->bits
                &&
                remote->toggle_bit<=remote->pre_data_bits
                +remote->bits
                +remote->post_data_bits)
            {
                ir_set_bit(&post,

```



```

    (char)(remote->pre_data_bits + remote->bits
    + remote->post_data_bits - remote->toggle_bit),
    (char)remote->repeat_state);
}
}

if(remote->post_p>0 && remote->post_s>0)
{
    send_pulse(remote->post_p);
    send_space(remote->post_s);
}
if (ir_code_hasData(&post)) {
    send_data(remote, &post, remote->post_data_bits);
}
}
}
void send_repeat(struct ir_remote *remote)
{

    send_lead(remote);
    send_pulse(remote->prepeat);
    send_space(remote->srepeat);
    send_trail(remote);
}
void send_code(struct ir_remote *remote, ir_code *code)
{
    if(remote->toggle_bit>0)
    {
        if(remote->toggle_bit>remote->pre_data_bits
        &&
        remote->toggle_bit<=remote->pre_data_bits
        +remote->bits)
        {
            ir_set_bit(code,
            (char)(remote->pre_data_bits + remote->bits - remote->toggle_bit),
            (char)remote->repeat_state);
        }
        else if(remote->toggle_bit>remote->pre_data_bits
        +remote->bits
        +remote->post_data_bits)
        {

        }
    }
}

if(repeat_remote==NULL || !(remote->flags&NO_HEAD_REP))
    send_header(remote);

```

```

send_lead(remote);

send_pre(remote);
send_data(remote,code,remote->bits);
send_post(remote);
send_trail(remote);
if(repeat_remote==NULL || !(remote->flags&NO_FOOT_REP))
    send_foot(remote);
}
int init_send(struct ir_remote *remote,struct ir_ncode *code)
{

    if(is_rcmm(remote))
    {

        return(0);
    }

    if(repeat_remote != NULL && has_repeat(remote))
    {

        if(remote->flags & REPEAT_HEADER && has_header(remote))
        {
            send_header(remote);
        }
        send_repeat(remote);
    }
    else
    {
        if(!is_raw(remote))
        {
            send_code(remote,&code->code);
        }
        else
        {
            sendRaw(code->signals,code->length);
        }
    }

    if(is_const(remote))
    {
        remote->remaining_gap=remote->gap;
    }
    else
    {
        if(has_repeat_gap(remote) &&
            repeat_remote!=NULL &&

```

```

    has_repeat(remote))
{
    remote->remaining_gap=remote->repeat_gap;
}
else
{
    remote->remaining_gap=remote->gap;
}
}
return(1);
}
void sendRaw(unsigned long *raw, int cnt)
{
    int i;

    for (i=0;i<cnt;i++) {
        if (i%2) send_space(raw[i]);
        else send_pulse(raw[i]);
    }
}
void send (struct ir_ncode *data, struct ir_remote *remote, unsigned short reps)
{
    if (!remote) return;

    if(remote->toggle_bit > 0) {
        remote->repeat_state = !remote->repeat_state;
    }
    init_send(remote,data);
    send_space(remote->remaining_gap);
    if (reps>0)
    {
        repeat_remote=remote;
        repeat_code=data;
        for (; reps > 0; --reps)
        {
            init_send(remote,data);
            send_space(remote->remaining_gap);
        }
        repeat_remote=NULL;
        repeat_code=NULL;
    }
}
#endif

```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#ifndef __fsdtablelarge_h_
#define __fsdtablelarge_h_
#include "support.h"
#include <stddef.h>
#include "eprom.h"
#define NUMSCRIPTS 3
#define NUMDYNAMICNODES 5
#define NUMDYNAMICATTRIBUTES 10
#define NUMDYNAMICTEXTCHUNKS 20
#define TEXT_CHUNK CHAR_BUFFERSIZE
#define SIZETEXTBUFFER TEXT_CHUNK * NUMDYNAMICTEXTCHUNKS
#define NODE_AVAILABLE (WORD) 0
#define NODE_ALLOCATED (WORD) 0x7000
#define NODE_ROOT -1
#define NODE_ELEMENT 1
#define NODE_ATTRIBUTE 2
#define NODE_TEXT 3
#define NODE_COMMENT 8
#define NODE_EMPTY -1
#define TEXTLOC_EMPTY -1
#define CHAR_BUFFERSIZE 24
typedef struct node_def Node;
typedef struct attribute_def Attribute;
typedef struct node_def *PtrNode;
typedef struct attribute_def *PtrAttribute;
typedef WORD NodeId;
typedef WORD TextLoc;
typedef char *PtrTextLoc;
struct control_def {
    WORD nextLocation;
    WORD numberScripts;
};
#define NEXTLOCATION offsetof(struct control_def, nextLocation)
#define NUMBERSSCRIPTS offsetof(struct control_def, numberScripts)
struct script_def {
    WORD type;
    WORD id;
    WORD location;
};
#define NOSCRIPT 0
#define MAINSCRIPT 1
#define IRSCRIPT 2

```

```

#define IRDATA 3
#define IRGETSCRIPTID 28001
struct header_def {
    WORD nodeOffset;
    WORD numNodes;
    WORD attributeOffset;
    WORD numAttributes;
    WORD textAreaOffset;
    WORD lenTextArea;
    WORD scriptType;
    WORD scriptId;
};
#define NODEPARENT  offsetof(struct node_def, parentnode)
#define TYPENODE  offsetof(struct node_def, typenode)
#define NEXTNODE  offsetof(struct node_def, nextnode)
#define FIRSTCHILD  offsetof(struct node_def, firstchild)
#define FIRSTATTRIBUTE  offsetof(struct node_def, firstattribute)
#define NODENAME  offsetof(struct node_def, locname)
#define NODENAMELEN  offsetof(struct node_def, lenname)
struct node_def {
    WORD parentnode;
    WORD typenode;
    WORD nextnode;
    WORD firstchild;
    WORD firstattribute;
    WORD locname;
    unsigned char lenname;
    unsigned char filler;
};
#define ATTRIBUTE_PARENT  offsetof(struct attribute_def, parentnode)
#define NEXTATTRIBUTE  offsetof(struct attribute_def, nextattribute)
#define ATTRIBUTENAME  offsetof(struct attribute_def, locname)
#define ATTRIBUTEVALUE  offsetof(struct attribute_def, locvalue)
#define ATTRIBUTENAMELEN  offsetof(struct attribute_def, lenname)
#define ATTRIBUTEVALUELEN  offsetof(struct attribute_def, lenvalue)
struct attribute_def {
    WORD parentnode;
    WORD nextattribute;
    WORD locname;
    WORD locvalue;
    unsigned char lenname;
    unsigned char lenvalue;
};
void fsd_Initialize(void);
void *fsd_fetchTextLocPtr(const TextLoc locText);
NodeId fsd_fetchNode(PtrNode pNode, NodeId node);
NodeId fsd_fetchNodeId(const NodeId node, const short offset);
TextLoc fsd_fetchNodeTextLoc(const NodeId node, const short offset);
NodeId fsd_fetchAttribute(PtrAttribute pAttribute, NodeId attribute) ;
NodeId fsd_fetchAttributeId(const NodeId attribute, const short offset);

```

```

TextLoc fsd_fetchAttributeTextLoc(const NodeId attribute, const short offset);
void fsd_fetchText(TextLoc textLoc, short textLen, char *buffer, const short len);
NodeId fsd_slotNode(void);
void fsd_scratchNode(const NodeId nodeId);
NodeId fsd_slotAttribute(void);
void fsd_scratchAttribute(const NodeId nodeId);
TextLoc fsd_slotTextBlock(void);
void fsd_scratchTextBlock(const TextLoc loc);
TextLoc fsd_addText(const char *sText);
void fsd_getText(const TextLoc locText, char *buffer, const short len);
void fsd_setNodeName(const NodeId node, const NodeId parent, const char *name);
NodeId fsd_getRootNode(void);
short fsd_getChildCount(const NodeId parentNode);
short fsd_getChildNodes(const NodeId parentNode, NodeId nodesFound[], const short len);
NodeId fsd_getChildByPos(const NodeId parentNode, const short pos);
void fsd_getNodeName(const NodeId nodeId, char *buffer, const short len);
short fsd_getNodesByName(const NodeId parentNode, const char *sName, NodeId nodesFound[], const short len);
short fsd_getAttributes(const NodeId parentNode, NodeId nodesFound[], const short len);
short fsd_getAttributeCount(const NodeId parentNode);
NodeId fsd_getAttributeByName(const NodeId parentNode, const char *sName);
NodeId fsd_getAttributeByPos(const NodeId parentNode, const short pos);
void fsd_getAttributeValue(const NodeId attribId, char *buffer, const short len);
void fsd_getAttribute(const NodeId parentNode, const char *attribName, char *buffer, const short len);
BOOL fsd_hasAttributes(const NodeId nodeId);
BOOL fsd_hasChildNodes(const NodeId nodeId);
NodeId fsd_setAttribute(const NodeId parentNode, const char *name, const char *value) ;
short fsd_getInteger(const char *value);
void fsd_switchRomBuffer(short newRomBuffer);
void fsd_unswitchRomBuffer();
void fsd_setMainScriptBuffer(void);
void fsd_setScriptBuffer(short scriptType, short scriptId);
void fsd_setScriptBufferNoLoad(struct eprom_script_def *script);
#ifdef PIC
void fsd_readRom(short offset, short numBytes);
void fsd_writeRom(short offset, short numBytes);
int fsd_readfile(short scriptType, short scriptId);
#endif
void fsd_LoadMainScript(void);
void fsdint_GetIrScript(void);
void fsdint_SetIrScript(short scriptId);
void fsd_clearEpromScript(short scriptType, short scriptId);
#endif

```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#ifndef __DELAY_H
#define __DELAY_H
#include "config.h"
extern unsigned char delayus_variable;
#if PIC_CLK == 4000000
#define DelayDivisor 4
#define WaitFor1Us asm("nop")
#define Jumpback asm("goto $ - 4")
#elif PIC_CLK == 8000000
#define DelayDivisor 2
#define WaitFor1Us asm("nop")
#define Jumpback asm("goto $ - 4")
#elif PIC_CLK == 10000000
#define DelayDivisor 2
#define WaitFor1Us asm("nop"); asm("nop");
#define Jumpback asm("goto $ - 6")
#elif PIC_CLK == 16000000
#define DelayDivisor 1
#define WaitFor1Us asm("nop")
#define Jumpback asm("goto $ - 4")
#elif PIC_CLK == 20000000
#define DelayDivisor 1
#define WaitFor1Us asm("nop"); asm("nop");
#define Jumpback asm("goto $ - 6")
#elif PIC_CLK == 32000000
#define DelayDivisor 1
#define WaitFor1Us asm("nop"); asm("nop"); asm("nop"); asm("nop"); asm("nop")
#define Jumpback asm("goto $ - 12")
#else
#error delay.h - please define PIC_CLK correctly
#endif
#define DelayUs(x) { \
    delayus_variable=(unsigned char)(x/DelayDivisor); \
    asm("movlb (_delayus_variable) >> 8"); \
    WaitFor1Us; } \
    asm("decfsz (_delayus_variable)&0ffh,f"); \
    Jumpback;
#define LOOP_CYCLES_CHAR 9
#define timeout_char_us(x) (long)((((x)/LOOP_CYCLES_CHAR)*(PIC_CLK/1000000/4))
#define LOOP_CYCLES_INT 16
#define timeout_int_us(x) (long)((((x)/LOOP_CYCLES_INT)*(PIC_CLK/1000000/4))
#define timeout_int_lobyte_zero_us(x) (long)((((x)/LOOP_CYCLES_INT)*(PIC_CLK/4.0)&0xFF00)

```

```
void DelayBigUs(unsigned int cnt);  
void DelayMs(unsigned int cnt);  
void DelayS(unsigned char cnt);  
#endif
```



```

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 *
 */
#include "support.h"
#include "fsdtablelarge.h"
#include "fsdinterpretable.h"
#include <string.h>
#include <time.h>
#ifdef IR_RULES
#include "sendircommon.h"
#endif
#ifdef IR_UNIV_CHIP
#include "sendirunivchip.h"
#endif
#ifdef DEBUG
#include <stdio.h>
#endif
extern char TEMPBUFFER[];
#ifdef PIC
#include <pic18.h>
extern long TICKS;
void checkButtons(void);
#endif
static BOOL condition(const char *name, const char *oper, const char *value);
static BOOL testCondition(NodeId commandNode);
static NodeId setupTrick(const NodeId commandNode);
void PushPlayInitialize(void);
static const char **sCommands;
static short (*processCommand)(short iCommand, NodeId commandNode, NodeId buttons[], short len);
static void (*infoCaller)(const char *msg);
static BOOL bStopInterpreter;
static BOOL bInterpreterStopped;
static BOOL bStopExecuteButton;
static BOOL bStopExecuteButtonInternal;
extern short maxNode;
extern short maxAttribute;
extern TextLoc maxTextLoc;
extern short currentScriptBuffer;
NodeId fsdint_formBufferNode(NodeId inNode)
{
    NodeId ret;
    if (inNode == NODE_ERROR) return inNode;
    if (inNode < 0)
        ret = ((currentScriptBuffer & 7) << 12) + 0x8000;
    else

```

```

    ret = currentScriptBuffer << 12;
    ret += inNode & 0xFFF;
    return ret;
}
NodeId fsdint_getBufferNode(NodeId inNode)
{
    if (inNode == NODE_ERROR) return inNode;
    if (inNode & 0x8000 ) {
        return (inNode & 0xFFF) + 0xF000;
    }
    else {
        currentScriptBuffer = (inNode & 0x7000) >> 12;
        return inNode & 0xFFF;
    }
}
void fsdint_initCommands(const char *Commands[], short (*procCall) (short, NodeId, NodeId[], short),
void(*infoCall)(const char *) )
{
    fsd_setMainScriptBuffer();

    sCommands = Commands;
    processCommand = procCall;
    infoCaller = infoCall;
    bStopInterpreter = FALSE;
    bInterpreterStopped = TRUE;
    fsdint_ButtonsOn();
}
short fsdint_lookupCommand(const char *command)
{
    short cnt;
    cnt = 0;
    while (1) {
        if (sCommands[cnt] == NULL) break;
        if (strcmp(sCommands[cnt], command) == 0) {
            return cnt;
        }
        cnt++;
    }
    return -1;
}
void fsdint_ButtonsOffInternal(void)
{
    bStopExecuteButtonInternal = TRUE;
}
void fsdint_ButtonsOnInternal(void)
{
    bStopExecuteButtonInternal = FALSE;
}
void fsdint_ButtonsOff(void)
{

```

```

    bStopExecuteButton = TRUE;
}
void fsdint_ButtonsOn(void)
{
    bStopExecuteButton = FALSE;
}
void fsdint_executeButton(const char *sName)
{
    if (!(bStopExecuteButton || bStopExecuteButtonInternal)) {
        SEnqueue(sName);
    }
}
void fsdint_startInterpreter()
{
    NodeId buttonNode;
    TextLoc loc;
    PtrTextLoc pCommand;
    long start;
    short firstLoop;
#ifdef AUTORUN
    int count=0;
#endif
    NodeId globalNode;
    short ret;
    start = 0;
    firstLoop = TRUE;
    bStopInterpreter = FALSE;
    pCommand = NULL;
    bInterpreterStopped = FALSE;
    EmptyStack();
    globalNode = fsd_slotNode();
    IPush(fsdint_formBufferNode(globalNode));
    fsdint_ButtonsOn();
    debugPutstrHi(("Intrp Started"));

    while (TRUE) {
#ifdef PIC
        checkButtons();
#endif
#ifdef AUTORUN
        if (count == 0 ) {
            fsdint_executeButton("Startup");
            count++;
        }
        else if (count == 1) {
            fsdint_executeButton("Button0");
            count++;
        }
        }
#endif
        if (!pCommand) {

```

```

loc = fsd_slotTextBlock();
pCommand = fsd_fetchTextLocPtr(loc);
}
if (pCommand == NULL) {
    debugPutstrHi("no TextLoc!");
    return;
};

if (firstLoop) {
    fsdint_executeButton("Startup");
}
#ifdef MANUALINPUT
if (!firstLoop && bStopInterpreter == FALSE) {

    puts("Button?: ");
    gets(pCommand);
    if (strlen(pCommand)) {
        fsdint_executeButton(pCommand);
    }
}

#endif
firstLoop = FALSE;
start = GetTicks();

if (bStopInterpreter == TRUE ) {
    fsdint_ButtonsOff();
    debugPutstrHi("Intrp Stopped");
    bInterpreterStopped = TRUE;
    break;
}
ret = SDequeue(pCommand, MAX_COMMANDSIZE);
if (ret) {
    fsd_setMainScriptBuffer();
    EmptyRStack();

    while (ICount() > 1) {
        IPop();
    }
    buttonNode = fsdint_findButton(NODE_ROOT, "Button", pCommand);
    if (buttonNode == NODE_ERROR ) {
        debugHi(("No script %s", pCommand));
    } else {

        debugHi(("Start: %s", pCommand));

        buttonNode = fsdint_formBufferNode(buttonNode);
        fsd_scratchTextBlock(loc);
        pCommand = NULL;
        fsdint_interpretButton (buttonNode);
    }
}

```

```

#ifdef PIC
    debugHi(("Time: %d", (short)((GetTicks() - start) / 1000)));
#else
    debugHi(("Time: %d", GetTicks() - start ));
#endif
    debugHi(("max: %d %d %d", maxNode,maxAttribute,maxTextLoc));
}
}
}
if (pCommand)
    fsd_scratchTextBlock(loc);
fsd_scratchNode(globalNode);
    EmptyIStack();
    EmptyRStack();
    EmptySQueue();
}
void fsdint_Initialize(void)
{

    fsd_Initialize();

    ir_Initialize();

    fsd_LoadMainScript();

    PushPlayInitialize();
}
void fsdint_RunInterpreter(void) {
    while(1) {
        fsdint_Initialize();
        fsdint_startInterpreter();
    }
}
void fsdint_Restart(void)
{
    epromInitialize(TRUE);
    bStopInterpreter = TRUE;
#ifdef PIC
    asm("reset");
#endif

}
void fsdint_Reset(void)
{
    bStopInterpreter = TRUE;

    fsd_clearEpromScript(MAINSCRIPT, -1);
}
void fsdint_GetIrScript(void)
{

```

```

epromInitialize(TRUE);
bStopInterpreter = TRUE;
}
void fsdint_SetIrScript(short scriptId)
{
    epromInitialize(TRUE);
    epromWriteWord(EEPROM_IR_SCRIPTID, scriptId);
    bStopInterpreter = TRUE;
}
NodeId fsdint_findButton(NodeId startNode, const char *sName, const char *sId)
{
    NodeId id;
    NodeId root;
    NodeId retId;
    TextLoc loc;
    PtrTextLoc nodeName;
    retId = NODE_ERROR;
    if (startNode == NODE_ROOT) {
        root = fsd_getRootNode();
    } else {
        root = startNode;
    }
    if (root == NODE_ERROR) {
        return NODE_ERROR;
    }
    loc = fsd_slotTextBlock();
    nodeName = fsd_fetchTextLocPtr(loc);
    if (nodeName == (PtrTextLoc)NODE_ERROR) return NODE_ERROR;
    id = fsd_fetchNodeId(root, FIRSTCHILD);
    while (!(id == NODE_EMPTY || id == NODE_ERROR) ) {

        fsd_getNodeName(id, nodeName, CHAR_BUFFERSIZE);
        if ( strcasecmp(nodeName,sName) == 0 ) {
            if (sId == NULL) {
                retId = id;
                break;
            }
            fsd_getAttribute(id, "id", nodeName, CHAR_BUFFERSIZE);
            if ( strcasecmp(nodeName,sId) == 0) {
                retId = id;
                break;
            }
        }
        id = fsd_fetchNodeId(id,NEXTNODE);
    }
    fsd_scratchTextBlock(loc);
    return retId;
}
void fsd_getCommandParameter(const char *name, const NodeId commandNode, char *buffer, const short len)

```

```

{
    IPush(fsdint_formBufferNode(commandNode));
    fsdint_fetch(name, buffer, len);
    IPop();
}

static NodeId setupTrick(const NodeId commandNode)
{
    char buffer[CHAR_BUFFERSIZE];
    NodeId trickNode;
    fsd_getCommandParameter("id", commandNode, buffer, CHAR_BUFFERSIZE);
    trickNode = fsdint_findButton(NODE_ROOT, "Trick", buffer);
    if ( trickNode == NODE_ERROR ) {
        debugHi(("No Trick: %s" , buffer));
        return NODE_ERROR;
    }
    else {
        debugHi(("Trick Start: %s", buffer));
        return trickNode;
    }
}

void fsdint_interpretButton(const NodeId buttonNode)
{
    NodeId commandNode;
    NodeId trickNode;
    short iCmd;
    short pos, i;
    short count;
    NodeId topNode, nextNode;
    NodeId buttons[NUMRETURNNODES];
    debugHi(("Stack Counts: %d %d" , ICount(), RCount()));
    topNode = fsdint_getBufferNode(buttonNode);
    pos = 0;
    while (1) {
#ifdef PIC
        checkButtons();
#endif
        if (pos == 0) {

            IPush(fsdint_formBufferNode(topNode));
        }
        commandNode = fsd_getChildByPos(topNode, pos);
        if (commandNode == NODE_ERROR) {

            IPop();

            if (RCount() > 0) {
                pos = RPop();
                nextNode = RPop();

                topNode = fsdint_getBufferNode(nextNode);
            }
        }
    }
}

```

```

    continue;
}
else {
    break;
}
}

```

```

    if ( !QueueIsEmpty() || bStopInterpreter ) {
break;
}
fsd_getNodeName(commandNode, TEMPBUFFER, CHAR_BUFFERSIZE);
    iCmd = fsdint_lookupCommand(TEMPBUFFER);
    if ( iCmd != -1 ) {
        switch (iCmd) {

```

```

case 27:
    if (testCondition(commandNode) ) {

        RPush(fsdint_formBufferNode(topNode));
        RPush(++pos);
        topNode = commandNode;
        pos = 0;

            continue;
        }
break;

```

```

case 29:
    trickNode = setupTrick(commandNode);
    if (trickNode != NODE_ERROR) {
        RPush(fsdint_formBufferNode(topNode));
        RPush(++pos);
        topNode = trickNode;
        pos = 0;
        continue;
    }
break;

    default:
        IPush(fsdint_formBufferNode(commandNode));
count = processCommand(iCmd, commandNode, buttons, NUMRETURNNODES);
    if (count > 0) {

```

```

RPush(fsdint_formBufferNode(topNode));
RPush(++pos);

```



```

RPush(fsdint_formBufferNode(commandNode));
RPush(1);
if (count > 1) {

    for (i = count - 1; i > 0; i--) {
        RPush(buttons[i]);
        RPush(0);
    }
}

topNode = fsdint_getBufferNode(buttons[0]);
pos = 0;
continue;
}
else {
    IPop();
}
}
}
pos++;
}
}
static BOOL testCondition(NodeId commandNode)
{
    char name[CHAR_BUFFERSIZE], value[CHAR_BUFFERSIZE], oper[CHAR_BUFFERSIZE];
    fsd_getCommandParameter("id", commandNode, name, CHAR_BUFFERSIZE);
    fsd_getCommandParameter("value", commandNode, value, CHAR_BUFFERSIZE);
    fsd_getCommandParameter("oper", commandNode, oper, CHAR_BUFFERSIZE);
    return condition(name, oper, value);
}
static BOOL condition(const char *name, const char *oper, const char *value)
{
    char sValue[CHAR_BUFFERSIZE];
    short result;

    fsdint_fetch(name, sValue, CHAR_BUFFERSIZE);
    result = strcmp(sValue, value);
    if (strcmp(oper, "eq") == 0) {
        if (result == 0) return TRUE;
    } else if (strcmp(oper, "neq") == 0) {
        if (result != 0) return TRUE;
    } else if (strcmp(oper, "gt") == 0) {
        if (result == 1) return TRUE;
    } else if (strcmp(oper, "lt") == 0) {
        if (result == -1) return TRUE;
    }
}

return FALSE;

```

```

}
void fsdint_store(const char *name, const char *value)
{
    NodeId node,nextNode;
    short saveRomBuffer;
    saveRomBuffer = currentScriptBuffer;
    nextNode = IPeek((short)(ICount() - 1));
    node = fsdint_getBufferNode(nextNode);
    if (node != NODE_ERROR ) {
        fsd_setAttribute (node, name, value);
    }
    currentScriptBuffer = saveRomBuffer;
}
void fsdint_fetch(const char *name, char *buffer, const short len)
{
    short iCnt;
    short i;
    NodeId node,nextNode;
    TextLoc loc1, loc2;
    PtrTextLoc sName, sAttrib;
    short saveRomBuffer;
    saveRomBuffer = currentScriptBuffer;
    loc1 = fsd_slotTextBlock();
    loc2 = fsd_slotTextBlock();
    sName = fsd_fetchTextLocPtr(loc1);
    sAttrib = fsd_fetchTextLocPtr(loc2);
    if (!sName || !sAttrib) {
        buffer[0] = 0;
        debugPutstrHi("slottextBlock failure");
        goto exit;
    }

    if (strlen(name) > (CHAR_BUFFERSIZE - 1)) {
        buffer[0] = 0;
        goto exit;
    }
    strcpy(sName, name);
    iCnt = ICount();
    i = 0;
    while(1) {
        nextNode = IPeek(i);
        node = fsdint_getBufferNode(nextNode);
        if ( node != NODE_ERROR ) {
            fsd_getAttribute(node, sName, sAttrib, CHAR_BUFFERSIZE);
            if (strlen(sAttrib) > 0) {

                if (sAttrib[0] == '@' ) {

                    strcpy(sName, &sAttrib[1]);
                    i = 0;

```

```

        continue;
    }
    else {
        break;
    }
}
}
i++;
if (i >= iCnt) break;
}
if (strlen(sAttrib) >= (unsigned short)(len - 1) ) {
    sAttrib[len - 1] = 0;
}
strcpy(buffer, sAttrib);
exit:
fsd_scratchTextBlock(loc1);
fsd_scratchTextBlock(loc2);
currentScriptBuffer = saveRomBuffer;
}
void fsdint_increment(const char *name, const short minValue, const short maxValue)
{
    short iValue;
    TextLoc loc1;
    PtrTextLoc sValue;
    loc1 = fsd_slotTextBlock();
    sValue = fsd_fetchTextLocPtr(loc1);
    if (sValue != (PtrTextLoc)NODE_ERROR) {
        fsdint_fetch(name, sValue, CHAR_BUFFERSIZE);
        iValue = fsd_getInteger(sValue);
        iValue++;
        if (iValue > maxValue) iValue = minValue;
        longToAscii(iValue, sValue);
        fsdint_store (name, sValue);
    }
    else {
        debugPutstrHi("slottextBlock failure");
    }
    fsd_scratchTextBlock(loc1);
}
void fsdint_append(const char *name, const char *value)
{
    TextLoc loc1;
    PtrTextLoc sValue;
    loc1 = fsd_slotTextBlock();
    sValue = fsd_fetchTextLocPtr(loc1);
    if (sValue != (PtrTextLoc)NODE_ERROR) {

        fsdint_fetch(name, sValue, CHAR_BUFFERSIZE);

        if ( ( strlen(sValue) + strlen(value)) < CHAR_BUFFERSIZE ) {

```

```

    strcat(sValue, value);
}
fsdint_store (name, sValue);
}
else {
    debugPutstrHi("slottextBlock failure");
}
fsd_scratchTextBlock(loc1);
}
long GetTicks(void)
{
#ifdef PIC
    return TICKS;
#else
    clock_t ticks;
    ticks = clock();
    return (long)ticks;
#endif
}
void fsdint_delay(long seconds, long milliseconds)
{
    long ticks;
    long intDelay;
#ifdef PIC
    return;
#endif
    intDelay = 0;
    if (seconds > 0) intDelay = seconds * 1000;
    intDelay += milliseconds;
    ticks = GetTicks() + intDelay;
    while (ticks > GetTicks()) {
#ifdef PIC
        checkButtons();
#endif
        if ( !QueueIsEmpty() || bStopInterpreter ) break;
    }
}
void fsdint_hardDelay(long seconds, long milliseconds)
{
    long ticks;
    long intDelay;
#ifdef PIC
    return;
#endif
    intDelay = 0;
    if (seconds > 0) intDelay = seconds * 1000;
    intDelay += milliseconds;
    ticks = GetTicks() + intDelay;
    while (ticks > GetTicks()) {
#ifdef PIC

```

```
    checkButtons();  
#endif  
    if ( bStopInterpreter ) break;  
}  
}
```

```
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 *
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 *
 */
#ifndef __squeue_h_
#define __squeue_h_
#include <string.h>
#define QUEUE_DIM 4
#define MAXQUEUELENGTH 16
void SEnqueue(const char *el);
char SDequeue(char *el, const int len);
void EmptySQueue(void);
char QueueIsEmpty(void);
char QueueIsFull(void);
#endif
```

```

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 *
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 *
 */
#ifndef _SERIAL_H_
#define _SERIAL_H_
#define BAUD 9600
#define FOSC PIC_CLK
#define NINE 0
#define OUTPUT 1
#define INPUT 1
#define SPBRG_DIVIDER ((int)(FOSC/(16UL * BAUD) -1))
#define HIGH_SPEED 1
#if NINE == 1
#define NINE_BITS 0x40
#else
#define NINE_BITS 0
#endif
#if HIGH_SPEED == 0
#define SPEED 0x4
#else
#define SPEED 0
#endif
void init_comms(void);
void putch(unsigned char);
unsigned char getch(void);
unsigned char getche(void);
char *getsNoEcho(char *s);
char *gets(char *s);
int puts(const char *s);
#endif

```

```
/*  
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 *  
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 *  
 * Arthur Gravina <art@agravina.com>  
 *  
 */
```

```
void errorBeep(void);  
void goodBeep(void);  
void keypressBeep(void);  
#ifdef PIC  
void beep( int frequency, int duration );  
#define BEEPER RC0  
#define c0 262  
#define cS0 277  
#define d0 294  
#define dS0 311  
#define e0 330  
#define f0 349  
#define fS0 370  
#define g0 392  
#define gS0 415  
#define a0 440  
#define aS0 466  
#define b0 494  
#define c1 523  
#define cS1 554  
#define d1 587  
#define dS1 622  
#define e1 659  
#define f1 698  
#define fS1 740  
#define g1 784  
#define gS1 831  
#define a1 880  
#define aS1 932  
#define b1 988  
#define c2 1047  
#define cS2 1109  
#define d2 1174  
#define dS2 1245  
#define e2 1319  
#define f2 1397  
#define fS2 1480  
#define g2 1568  
#define gS2 1661  
#define a2 1760  
#define aS2 1965
```



```
#define b2 1976
#define c3 2093
#define cS3 2217
#define d3 2344
#define dS3 2489
#define e3 2637
#define f3 2794
#define fS3 2960
#define g3 3136
#define gS3 3322
#define a3 3520
#define aS3 3729
#define b3 3951
#define SIXTEENTH 63
#define EIGHTH 125
#define QUARTER 250
#define HALF 500
#define WHOLE 1000
#endif
```

```

/*
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 *
 */
#ifndef __support_h_
#define __support_h_
#define PIC 1
#define FLASHAREASIZE 63000 - FLASHAREAORIGIN
#define FLASHAREAORIGIN 49152
#ifdef PIC
#define strcasecmp strcmp
#define strncasecmp stricmp
#else
#define strcasecmp _strcmp
#define strncasecmp _stricmp
#endif
#define DEBUG 2
#define IR_UNIV_CHIP 1
#define TEMPBUFFER_SIZE 64
#ifdef DEBUG
#include <stdio.h>
#endif
#include <stdlib.h>
#define FatalError( Str ) debug(Str); asm(" reset")
#define Error( Str ) debug(Str)
#define ErrorMessageC(Str) debug((Str))
#define FatalMsgC(Str) FatalError((Str))
#define FALSE 0
#define TRUE 1
#define NODE_ERROR 0x4004
typedef long DWORD;
typedef unsigned long UDWORD;
typedef char BOOL;
typedef unsigned char BYTE;
typedef short WORD;
typedef unsigned short UWORD;
typedef int INT;
typedef unsigned int UINT;
#ifdef DEBUG
#define debugPutstr(x) puts(x);
#define debug(x) printf x; printf("\r\n");
#if (DEBUG >= 2)
#define debugPutstrHi(x) puts(x);
#define debugHi(x) printf x; printf("\r\n");
#else
#define debugPutstrHi(x)

```

```
#define debugHi(x)
#endif
#else
#define debug(x)
#define debugHi(x)
#define debugPutstr(x)
#define debugPutstrHi(x)
#endif
void longToAscii (unsigned long input, char *str);
#define DIRECTORY "c:\\smarttoy\\"
#define LOGFILE "logs\\fsdClog.txt"
#endif
```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#include <stdarg.h>
#include <time.h>
#ifdef DEBUG
#include <stdio.h>
#endif
#ifdef PIC
void logMessage(const char *format, ...)
{
    FILE *outp;
    char temp[9];
    va_list args;
    if( (outp = fopen(DIRECTORY LOGFILE, "at")) != NULL )
    {
        va_start(args, format);
        _strdate(temp);
        fprintf(outp, "%s ", temp);
        _strtime(temp);
        fprintf(outp, "%s ", temp);
        vfprintf(outp, format, args);
        fputs( "\n", outp);
        fclose( outp );
        va_end(args);
    }
}
#endif
void longToAscii (unsigned long input, char *str)
{
    char digit, count=0, dest=0;
    char buffer[12];
    for (digit=0; digit < 12; digit++) {
        buffer[digit] = (char) ((input % 10) + '0');
        input = input / 10;
        count++;
    }
    if (input == 0) break;
    while (count-- > 0) {
        str[dest++] = buffer[count];
    }
    str[dest] = 0;
}
#endif

```

```
void DelayMs(short ms)
{
}
#endif
```

```

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 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#ifdef IR_RULES
#include <stddef.h>
#include "fsdinterpretable.h"
#define IR_RULES 1
#define PRONTOFREQUENCY 1000000
#define MAXIRWORDS 80
#ifdef PIC
#include <pic18.h>
#include "mainlinepic.h"
#define IR_LED_ON    pwm_start()
#define IR_LED_OFF   pwm_stop()
#endif
void ir_initDevice(void);
void ir_LedOn(const unsigned short T);
void ir_LedOff(const unsigned short T);
void ir_Initialize(void);
long ir_CalcFrequency(const short N);
short ir_CalcOneCycle(const long frequency);
#define MAXIRCOMMAND 29
#define TITLE 0
#define MENU 1
#define PLAY 2
#define STOPDVD 3
#define PAUSE 4
#define STEP 5
#define PREVCHAPTER 6
#define NEXTCHAPTER 7
#define SEARCH 8
#define NAV_UP 9
#define NAV_DOWN 10
#define NAV_LEFT 11
#define NAV_RIGHT 12
#define REWIND 13
#define FORWARD 14
#define NUM_1 15
#define NUM_2 16
#define NUM_3 17
#define NUM_4 18
#define NUM_5 19
#define NUM_6 20
#define NUM_7 21

```

```
#define NUM_8 22
#define NUM_9 23
#define NUM_0 24
#define NUM_TEN_PLUS 25
#define POWER 26
#define MAXIRMACRO 3
#define CHAPTERSEEK 0
#define TITLESEEK 1
#define TIMESEEK 2
#define DVDDEVICE 100
#define SUBTITLE 26
#define AUDIO 27
#define ZOOM 29
#define REPEAT 32
#define SLOW 33
#define SHUFFLE 34
#define DISPLAY 35
#define PROGRAM_APEX 36
#define ANGLE 37
#define LEARN 71
#define PROGRAM_SPITFIRE 64
#define OPEN_CLOSE 13
#define SETUP_SAMPO 12
#define FourX_SPITFIRE 84
#define OneX_SPITFIRE 81
#endif
```

```

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 *
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 *
 */
#ifndef __i2c_ccs_H
#define __i2c_ccs_H
void random_write(char dev_adr, int mem_adr, char dat);
char random_read(char dev_adr, int mem_adr);
void random_readM(char dev_adr, int mem_adr, void *Data, char Num);
short ROM_ReadWord(int address);
void ROM_Send(int Address, char *Data, char Num);
void ROM_Read(int Address, void *Data, char Num);
char i2c_in_byte(void);
void i2c_out_byte(char o_byte);
void i2c_nack(void);
void i2c_ack(void);
void i2c_start(void);
void i2c_stop(void);
void i2c_high_sda(void);
void i2c_low_sda(void);
void i2c_high_scl(void);
void i2c_low_scl(void);
#define TxData 0
#define SDA_PIN RC4
#define SCL_PIN RC3
#define SDA_DIR TRISC4
#define SCL_DIR TRISC3
#define I2C_DELAY 0
#endif

```



```

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 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#include "squeue.h"
#include "fsdtablelarge.h"
#include "fsdinterpretable.h"
#include "eprom.h"
#include "beep.h"
#include "sendircommon.h"
#include "sendirrules.h"
#ifdef PIC
#include "i2c_ccs.h"
#include "tablereadwrite.h"
#include "mainlinepic.h"
#include "delay.h"
#endif
extern const unsigned char *flashMemory;
void testFsd(void)
{

    fsdint_RunInterpreter();

}

```

```

/*
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 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#include "rstack.h"
#ifdef PIC
near
#endif
static int sp=0;
static RElementType val[RMAXDIM];
void RPush(const RElementType f)
{
    if (sp<RMAXDIM) {
        val[sp++]=f;
    }
    else {
        debugPutstrHi("RSTack Oflow");
    }
}
RElementType RPop(void)
{
    if (sp>0)
        return val[--sp];
    else {
        return ISTKERROR;
    }
}
RElementType RPeek(const int Item)
{
    if (Item >= 0 && Item < sp)
        return val[sp - Item - 1];
    else {
        return ISTKERROR;
    }
}
int RCount()
{
    return sp;
}
void EmptyRStack(void)
{
    sp = 0;
}

```

```
'  
' PushPlay -- An Xml Document emulator\interpreter for microprocessors  
' Copyright (C) 2002, Arthur Gravina. Confidential.  
' Arthur Gravina <art@agravina.com>  
'  
,
```

VERSION 1.0 CLASS

BEGIN

MultiUse = -1

Persistable = 0

DataBindingBehavior = 0

DataSourceBehavior = 0

MTSTransactionMode = 0

END

Attribute VB_Name = "FSDCompileScript"

Attribute VB_GlobalNameSpace = False

Attribute VB_Creatable = True

Attribute VB_PredeclaredId = False

Attribute VB_Exposed = False

Option Explicit

Public Event info(sMsg As String)

Private oXml As XmlDocument30

Private indent As Integer

Private colText As New Dictionary

Private Sub saveNodeDynamic(nodeId As Integer, node As node_def)

 If nodeId < 0 Then

 MsgBox "saveNodeDynamic: trying to save a "
 dynamicNodes(Abs(nodeId) - 2) = node

 Else

 nodes(nodeId) = node

 End If

End Sub

Private Sub setLocations()

 Dim offset As Integer

 Dim nodeSize As node_def

 Dim attrSize As attribute_def

 Dim root As Integer

 Dim temp As String

 Dim attr As Integer

 On Error GoTo errrtn

 header.nodeOffset = Len(header)

 offset = header.nodeOffset

 header.numNodes = numNodes

 offset = offset + numNodes * Len(nodeSize)

 header.attributeOffset = offset

 header.numAttributes = numAttributes

 offset = offset + numAttributes * Len(attrSize)

 header.textAreaOffset = offset

 header.lenTextArea = nextTextLoc

 root = fsd_getRootNode()

```

attr = fsd_getAttributeByName(root, "scriptType")
If (attr <> -1) Then
    header.scriptType = CInt(fsd_getAttributeValue(attr))
Else
    header.scriptType = 0
End If
attr = fsd_getAttributeByName(root, "scriptId")
If (attr <> -1) Then
    header.scriptId = CInt(fsd_getAttributeValue(attr))
Else
    header.scriptId = 0
End If
Exit Sub
errrtn:
    MsgBox "setLocations Error: " & Error
End Sub
Sub fsd_writeFile(filename As String)
    Dim i As Integer
    On Error Resume Next
    On Error Resume Next
    RaiseEvent info("Writing.. " & filename)
    Kill filename
    On Error GoTo err
    setLocations
    Open filename For Binary As #1
    Put #1, 1, header
    Put #1, , nodes
    Put #1, , attributes
    ReDim Preserve textBuffer(nextTextLoc - 1)
    Put #1, , textBuffer
err:
    Close #1
End Sub
Function fsd_loadScript(sName As String, errors As String) As Boolean
    Dim ret As Boolean
    Dim root
    Dim buttonlist As IXMLDOMNodeList
    Dim commandlist As IXMLDOMNodeList
    Dim buttonNode As IXMLDOMNode
    Dim commandNode As IXMLDOMNode
    Dim sCmdName As String
    Dim iCmd As Integer
    Dim i As Integer, j As Integer
    Set oXml = Nothing
    Set oXml = New DOMDocument30
    oXml.async = False
    ret = oXml.Load(sName)
    If oXml.parseError.errorCode <> 0 Then
        With oXml.parseError
            errors = "document Parse Error:" & vbCrLf & _

```

```

        "Code: " & .errorCode & vbCrLf & _
        "Line: " & .Line & vbCrLf & _
        "IPos: " & .linepos & vbCrLf & _
        "Reason: " & .reason & vbCrLf & _
        "Src: " & .srcText & vbCrLf & _
        "fPos: " & .filepos
    End With
    fsd_loadScript = False
    Set oXml = Nothing
    Exit Function
End If
fsd_loadScript = True
End Function
Public Sub WalkTree()
    indent = 0
    treeWalk oXml
End Sub
Private Function attributeWalk(node As IXMLDOMNode)
    Dim i As Integer
    Dim ostr As String
    Dim attrib As IXMLDOMAttribute
    For Each attrib In node.attributes
        For i = 1 To indent
            ostr = ostr & " "
        Next
        ostr = ostr & "|--"
        ostr = ostr & attrib.nodeTypeString
        ostr = ostr & ":"
        ostr = ostr & attrib.name
        ostr = ostr & "--"
        ostr = ostr & attrib.nodeValue
        RaiseEvent info(ostr)
        ostr = ""
    Next
End Function
Private Function treeWalk(node As IXMLDOMNode)
    Dim nodeName As String
    Dim root As IXMLDOMNode
    Dim child As IXMLDOMNode
    Dim i As Integer
    Dim ostr As String
    indent = indent + 2
    For Each child In node.childNodes
        For i = 1 To indent
            ostr = ostr & " "
        Next
        ostr = ostr & "|--"
        ostr = ostr & (child.nodeTypeString)
        ostr = ostr & "--"
        If child.nodeType < 3 Then

```

```

    ostr = ostr & child.nodeName
    RaiseEvent info(ostr)
    ostr = ""
End If
If (child.nodeType = 1) Then
    If (child.attributes.length > 0) Then
        indent = indent + 2
        attributeWalk child
        indent = indent - 2
    End If
End If
If (child.hasChildNodes) Then
    treeWalk child
Else
    ostr = ostr & child.Text
    RaiseEvent info(ostr)
    ostr = ""
End If
Next
indent = indent - 2
End Function
Private Sub compileAttributeWalk(node As IXMLDOMNode, parentNodeId As Integer)
    Dim i As Integer
    Dim ostr As String
    Dim attrib As IXMLDOMAttribute
    Dim firstTime As Boolean
    Dim prevAttributeNode As Integer
    Dim attributeNode As Integer
    Dim localNode As node_def
    Dim localAttribute As attribute_def
    firstTime = True
    prevAttributeNode = -1
    For Each attrib In node.attributes
        attributeNode = addAttribute(attrib, parentNodeId)
        If prevAttributeNode <> -1 Then
            localAttribute = fetchAttribute(prevAttributeNode)
            localAttribute.nextAttribute = attributeNode
            saveAttribute prevAttributeNode, localAttribute
        End If
        If parentNodeId <> -1 And firstTime = True Then
            localNode = fetchNode(parentNodeId)
            localNode.firstAttribute = attributeNode
            saveNodeDynamic parentNodeId, localNode
        End If
        prevAttributeNode = attributeNode
        RaiseEvent info(" AddAttribute: " & attrib.nodeName & "=" & attrib.nodeValue)
        firstTime = False
    Next
End Sub
Private Sub compileWalk(node As IXMLDOMNode, parentNodeId As Integer)

```

```

Dim root As IXMLDOMNode
Dim child As IXMLDOMNode
Dim i As Integer
Dim ostr As String
Dim nodeId As Integer
Dim prevNodeId As Integer
Dim firstTime As Boolean
Dim localNode As node_def
prevNodeId = -1
firstTime = True
For Each child In node.childNodes
    nodeId = addNode(child, parentNodeId)
    RaiseEvent info("Add Node: " & child.nodeName & "(" & nodeId & ")")
    If prevNodeId <> -1 Then
        localNode = fetchNode(prevNodeId)
        localNode.nextNode = nodeId
        saveNodeDynamic prevNodeId, localNode
    End If
    prevNodeId = nodeId
    If parentNodeId <> -1 And firstTime = True Then
        localNode = fetchNode(parentNodeId)
        localNode.firstChild = nodeId
        saveNodeDynamic parentNodeId, localNode
    End If
    firstTime = False
    If (child.nodeType = 1) Then
        If (child.attributes.length > 0) Then
            compileAttributeWalk child, nodeId
        End If
    End If
    If (child.hasChildNodes) Then
        compileWalk child, nodeId
    End If
Next
End Sub

Sub fsd_Compile(inFileName As String)
    Dim totSize As Integer
    Dim nodeSize As node_def
    Dim attrSize As attribute_def
    fsd_Initialize
    colText.CompareMode = BinaryCompare
    colText.removeAll
    ReDim textBuffer(10000)
    compileWalk oXml, -1
    totSize = nextTextLoc
    totSize = totSize + (Len(nodeSize) * numNodes)
    totSize = totSize + (Len(attrSize) * numAttributes)
    RaiseEvent info("Text=" & nextTextLoc & ", Nodes=" & Len(nodeSize) * numNodes & _
        ", attributes=" & Len(attrSize) * numAttributes & ", Total=" & totSize)
    fsd_writeFile inFileName

```

End Sub

Private Function addNode(node As IXMLDOMNode, parentNodeId As Integer) As Integer

```
    Dim cNode As node_def
    Dim sName As String
    Dim nodeId As Integer
    nodeId = numNodes
    ReDim Preserve nodes(numNodes)
    numNodes = numNodes + 1
    cNode.typeNode = node.nodeType
    cNode.parentNode = parentNodeId
    cNode.nextNode = -1
    cNode.firstAttribute = -1
    cNode.firstChild = -1
    sName = node.nodeName
    cNode.locName = addCompiledText(sName)
    cNode.lenName = CByte(Len(sName))
    nodes(nodeId) = cNode
    addNode = nodeId
```

End Function

Private Function addAttribute(attrNode As IXMLDOMAttribute, parentNode As Integer) As Integer

```
    Dim attributeNode As attribute_def
    Dim sName As String, sValue As String
    Dim attrId As Integer
    attrId = numAttributes
    ReDim Preserve attributes(numAttributes)
    numAttributes = numAttributes + 1
    attributeNode.parentNode = parentNode
    attributeNode.nextAttribute = -1
    sName = attrNode.name
    sValue = attrNode.nodeValue
    attributeNode.locName = addCompiledText(sName)
    attributeNode.lenName = CByte(Len(sName))
    attributeNode.locValue = addCompiledText(sValue)
    attributeNode.lenValue = CByte(Len(sValue))
    attributes(attrId) = attributeNode
    addAttribute = attrId
```

End Function

Sub interpretWalk(node As Integer)

```
    Dim i As Integer
    Dim childCount As Integer
    Dim nodeId As Integer
    childCount = fsd_getChildCount(node)
    For i = 0 To childCount - 1
        nodeId = fsd_getNthNode(node, i)
        RaiseEvent info("Add Node: " & fsd_getNodeName(nodeId) & "(" & nodeId & ")")
        If (fsd_hasAttributes(nodeId)) Then
            interpretAttributeWalk nodeId
        End If
        If (fsd_hasChildNodes(nodeId) = True) Then
            interpretWalk nodeId
        End If
    Next i
```



```

    End If
Next
End Sub
Sub interpretAttributeWalk(node As Integer)
    Dim i As Integer
    Dim attributeCount As Integer
    Dim nodeId As Integer
    attributeCount = fsd_getAttributeCount(node)
    For i = 0 To attributeCount - 1
        nodeId = fsd_getNthAttribute(node, i)
        RaiseEvent info(" AddAttribute: " & fsd_getAttributeName(nodeId) & "=" & fsd_getAttributeValue(nodeId))
    Next
End Sub
Private Function findText(sText As String) As Integer
    On Error GoTo notfound
    If (colText.Exists(sText)) Then
        findText = colText.Item(sText)
    Else
        findText = -1
    End If
    Exit Function
notfound:
    findText = -1
End Function
Private Function addText(sText As String) As Integer
    Dim slen As Integer
    Dim loc As Integer
    Dim bt As Byte
    Dim ba() As Byte
    Dim i As Integer
    On Error GoTo errrtn
    slen = Len(sText)
    If slen = 0 Then
        addText = -1
        Exit Function
    End If
    loc = nextTextLoc
    If (loc + slen + 2) >= UBound(textBuffer) Then
        ReDim Preserve textBuffer(UBound(textBuffer) + 1024)
    End If
    ba = StringToSingleBytes(sText)
    For i = 0 To slen - 1
        textBuffer(nextTextLoc) = ba(i)
        nextTextLoc = nextTextLoc + 1
    Next i
    textBuffer(nextTextLoc) = 0
    nextTextLoc = nextTextLoc + 1
    addText = loc
    Exit Function
errrtn:

```

```
    MsgBox "Error: " & err
End Function

Private Function addCompiledText(sText As String) As Integer
    Dim slen As Integer
    Dim loc As Integer
    Dim bt As Byte
    Dim ba() As Byte
    Dim i As Integer
    On Error GoTo errrtn
    slen = Len(sText)
    If slen = 0 Then
        addCompiledText = -1
        Exit Function
    End If
    loc = findText(sText)
    If loc = -1 Then
        loc = addText(sText)
        colText.Add sText, loc
    End If
errrtn:
    addCompiledText = loc
End Function
```

Type=Exe
Reference=*\\G{00020430-0000-0000-C000-000000000046}#2.0#0#...\\WINDOWS\\System32\\Stdole2.tlb#OLE Automation
Reference=*\\G{F5078F18-C551-11D3-89B9-0000F81FE221}#3.0#0#...\\WINDOWS\\System32\\msxml3.dll#Microsoft XML, v3.0
Reference=*\\G{420B2830-E718-11CF-893D-00A0C9054228}#1.0#0#...\\WINDOWS\\System32\\scrrun.dll#Microsoft Scripting Runtime
Class=FSDCompileScript; FSDCompileScript.cls
Module=FastSimpleDocument; FastSimpleDocument.bas
Form=Form1.frm
Startup="Form1"
ExeName32="CompileIrCodes.exe"
Command32=""
Name="CompileIrCodes"
HelpContextID="0"
CompatibleMode="0"
MajorVer=1
MinorVer=0
RevisionVer=0
AutoIncrementVer=0
ServerSupportFiles=0
VersionCompanyName="Systems1"
CompilationType=0
OptimizationType=0
FavorPentiumPro(tm)=0
CodeViewDebugInfo=0
NoAliasing=0
BoundsCheck=0
OverflowCheck=0
FIPointCheck=0
FDIVCheck=0
UnroundedFP=0
StartMode=0
Unattended=0
Retained=0
ThreadPerObject=0
MaxNumberOfThreads=1
[MS Transaction Server]
AutoRefresh=1

```

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 *
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 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#ifdef IR_UNIV_CHIP
#include <string.h>
#include <stdio.h>
#include "fsdtablelarge.h"
#include "fsdinterprettable.h"
#include "sendirunivchip.h"
#include "beep.h"
#endif
#include <conio.h>
#endif

static void sndByte(unsigned char c);
#define Device_DVD 0x6000
const struct flaglist allCommands[] = {
{"TITLE", TITLE},
{"MENU", MENU},
{"PLAY", PLAY},
{"STOP", STOPDVD},
{"PAUSE", PAUSE},
{"STEP", STEP},
{"PREVCHAPTER", PREVCHAPTER},
{"NEXTCHAPTER", NEXTCHAPTER},
{"SEARCH", SEARCH},
{"NAV_UP", NAV_UP},
{"NAV_DOWN", NAV_DOWN},
{"NAV_LEFT", NAV_LEFT},
{"NAV_RIGHT", NAV_RIGHT},
{"REWIND", REWIND},
{"FORWARD", FORWARD},
{"NUM_1", NUM_1},
{"NUM_2", NUM_2},
{"NUM_3", NUM_3},
{"NUM_4", NUM_4},
{"NUM_5", NUM_5},
{"NUM_6", NUM_6},
{"NUM_7", NUM_7},
{"NUM_8", NUM_8},
{"NUM_9", NUM_9},
{"NUM_0", NUM_0},
{"NUM_TEN_PLUS", NUM_TEN_PLUS},
{"POWER", POWER},
{NULL, 0},

```

```

};
extern short irScriptBuffer;
static short irmacros[MAXIRMACRO+1];
static short DeviceNumber;
short devTicks;
static void sndByte(unsigned char c)
{
#ifdef PIC
    putchar(c);
#else
    _putchar(c);
#endif
}
void ir_initDevice(void)
{
    NodeId nodeDevice;
    char buffer[4];
    fsd_switchRomBuffer(irScriptBuffer);
    nodeDevice = fsd_getRootNode();
    if (nodeDevice != NODE_ERROR) {

        fsd_getAttribute(nodeDevice, "ticks", buffer, 4);
        devTicks = (short)atoi(buffer);
    }
    else {
        devTicks = -1;
    }
    debugHi(("devTicks %d node %d", devTicks, nodeDevice));
    fsd_unswitchRomBuffer();
    return;
}
void ir_Initialize(void)
{
    struct eprom_script_def script;
    short scriptType, scriptId;
    devTicks = -1;
    scriptType = IRSCRIPT;
    if (epromValid() ) {
        scriptId = epromReadWord(EEPROM_IR_SCRIPTID);
    }
    else {
        scriptId = -1;
    }
    if (scriptId != -1) {
        if (epromGetScript(scriptType, scriptId, &script) == -1) {
            fsd_setScriptBuffer(scriptType, scriptId);
        } else {
            fsd_setScriptBufferNoLoad(&script);
        }
    }
}

```

```

ir_initDevice();
if (devTicks == 0) devTicks = -1;
}
if (devTicks == -1) {
    errorBeep();
    debugPutstrHi("No ir device");
}
}
static unsigned char getDeviceType(char pos)
{
    short dt;
    dt = Device_DVD | DeviceNumber;
    return dt >> (8 * pos);
}
void ir_setDeviceNumber(short num)
{
    DeviceNumber = num;
}
static unsigned char checkStatus(void)
{

    return TRUE;
}
unsigned char ir_sendWords(unsigned char code)
{
    unsigned char flag;
    debug(("\\nir_SendKey: %d", code));
    flag = 0;
    sndByte('U');
    sndByte('I');
    sndByte('B');
    sndByte('1');
    sndByte(getDeviceType(0));
    sndByte(getDeviceType(1));
    sndByte(code);
    sndByte(flag);
    return(checkStatus());
}
void ir_sendNumbersString(const char *sNum)
{
    char sNumber;

    while((sNumber = *sNum++) > 0) {
        sNumber -= '0';
        switch (sNumber) {
            case 0:
                ir_sendWords(NUM_0);
                break;
            case 1:

```

```

        ir_sendWords(NUM_1);
break;
    case 2:
        ir_sendWords(NUM_2);
break;
    case 3:
        ir_sendWords(NUM_3);
break;
    case 4:
        ir_sendWords(NUM_4);
break;
    case 5:
        ir_sendWords(NUM_5);
break;
    case 6:
        ir_sendWords(NUM_6);
break;
    case 7:
        ir_sendWords(NUM_7);
break;
    case 8:
        ir_sendWords(NUM_8);
break;
    case 9:
        ir_sendWords(NUM_9);
break;
    }
#ifdef PIC
#endif
}

unsigned char ir_lookupButton(const char *buttonName)
{
    const struct flaglist *flaglptr;
    unsigned char command;
    command = 255;
    flaglptr=allCommands;
    while(flaglptr->name!=NULL){
        if(strnocasecmp(flaglptr->name, buttonName)==0){
            command= flaglptr->flag;
            break;
        }
        flaglptr++;
    }
    return command;
}

NodeId ir_findMacro(short butNumber, const char *butName)
{
    NodeId butLoc;
    fsd_switchRomBuffer(irScriptBuffer);

```

```
if (butNumber >= 0 && butNumber <= MAXIRMACRO) {
    if (  irmacros[butNumber] == NODE_ERROR) {
        butLoc = fsdint_findButton(NODE_ROOT, "IrMacro", butName);
        irmacros[butNumber] = butLoc;
    }
    else {
        butLoc = irmacros[butNumber];
    }
}
if (butLoc != NODE_ERROR) {
    butLoc = fsdint_formBufferNode(butLoc);
}
fsd_unswitchRomBuffer();
return butLoc;
}
#endif
```



```

/*
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 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#ifdef IR_RULES
#include "fsdinterprettable.h"
#define irdataOffset offsetFlashMemory
#define RC5_CODE 0x0001
#define RC6_CODE 0x0002
#define RCMM 0x0004
#define SPACE_ENC 0x0008
#define REVERSE 0x0010
#define NO_HEAD_REP 0x0020
#define NO_FOOT_REP 0x0040
#define CONST_LENGTH 0x0080
#define RAW_CODES 0x0100
#define REPEAT_HEADER 0x0200
#define SHIFT_ENC RC5_CODE
#define SPECIAL_TRANSMITTER 0x0400
#define PULSE_BIT 0x1000000
struct flaglist {
    const char *name;
    int flag;
};
#define IR_CODE_LENGTH 2
struct ir_code_tag
{
    unsigned long data[IR_CODE_LENGTH];
    unsigned char bits[IR_CODE_LENGTH];
};
typedef struct ir_code_tag ir_code;
struct mytimeval {
    long tv_sec;
    long tv_usec;
};
struct ir_ncode {
    char *name;
    ir_code code;
    int length;
    unsigned long *signals;
};
struct ir_remote
{
    char *name;
    struct ir_ncode *codes;

```

```
int bits;
unsigned int flags;
```

```
unsigned int phead,shead;
unsigned int pthree,sthree;
unsigned int ptwo,stwo;
unsigned int pone,sone;
unsigned int pzero,szero;
unsigned int plead;
unsigned int ptrail;
unsigned int pfoot,sfoot;
unsigned int prepeat,srepeat;
int pre_data_bits;
ir_code pre_data;
int post_data_bits;
ir_code post_data;
unsigned int pre_p,pre_s;
unsigned int post_p, post_s;
unsigned long gap;
unsigned long repeat_gap;
int toggle_bit;
unsigned int min_repeat;
unsigned int freq;
unsigned int duty_cycle;
```

```
    unsigned int repeat_state;
    struct ir_ncode *last_code;
    unsigned int reps;
    struct mytimeval last_send;
    unsigned long remaining_gap;
    struct ir_remote *next;
```

```
};
```

```
unsigned long s_strtoul(char *val, char **endptr, char base);
void send_space(unsigned long length);
void send_pulse(unsigned long length);
void ir_send_data_long(unsigned long value, char bits);
void ir_code_init(ir_code *code);
void ir_initPointersFromRom(short address, short len);
void ir_strtocode(char *val, char which, char numBits, ir_code *code);
void ir_set_bit(ir_code *code, short bitnum, char data);
char ir_get_bit(ir_code *code, short bitnum);
void ir_reverse(ir_code *inCode, ir_code *outCode);
void ir_send_header(struct ir_remote *remote);
void ir_LedOn(const unsigned short T);
void ir_LedOff(const unsigned short T);
void ir_sendcode(struct ir_remote *remote, char *button_name);
void send (struct ir_ncode *data,struct ir_remote *remote, unsigned short reps);
void sendRaw(unsigned long *raw, int cnt);
```

```
void ir_initWords(unsigned char command);
void ir_addWord(char flag, unsigned long word);
void ir_sendWords(unsigned char command);
void ir_endWords(unsigned char command);
void ir_configIrCodes(void);
void ir_configTest(void);
void ir_configIrCodesRom(void);
unsigned char ir_lookupButton(const char *buttonName);
void ir_sendNumbersString(const char *sNum);
NodeId ir_findMacro(short butNumber, const char *butName);
void ir_rulesInit(void);
#endif
```

```

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 *
 */
#include "support.h"
#include "eprom.h"
#ifdef PIC
#include "delay.h"
#include <pic18.h>
static void epromDelay(void)
{
    DelayMs(10);
}
short epromReadWord(short address)
{
    short data;

    EEPROM_READ(address);
    data = EEDATA << 8;
    address++;
    EEPROM_READ(address);
    data = data | EEDATA;
    return data;
}
void epromWriteWord(short address, short data)
{
    EEPROM_WRITE(address, data >> 8);
    epromDelay();
    address++;
    EEPROM_WRITE(address, data & 0xFF);
    epromDelay();
}
#else
#include <io.h>
#include <fcntl.h>
#include <stdio.h>
#include <sys/stat.h>
#define EPROM_FILE "c:\\smarttoy\\eprom.dat"
short epromReadWord(short address)
{
    int fh;
    int ret;
    short data;
    fh = _open(EPROM_FILE, _O_RDONLY | _O_BINARY | _O_RANDOM);
    if (fh == -1) {

```

```

        return -1;
    }

    ret = _lseek(fh, (long)address, SEEK_SET);
    if (ret != address) {
        return -1;
    }
    ret = _read( fh, &data, sizeof( data ));
    if (ret == sizeof(data) ) {
        return data;
    }
    else {
        return -1;
    }
}

void epromWriteWord(short address, short data)
{
    int fh;
    int ret;
    fh = _open(EPROM_FILE, _O_RDWR | _O_BINARY | _O_CREAT | _O_RANDOM, _S_IWRITE );
    if (fh == -1) {
        return ;
    }

    ret = _lseek(fh, (long)address, SEEK_SET);
    if (ret != address) {
        return;
    }
    ret = _write( fh, &data, sizeof( data ));
    _close(fh);
}

#endif

short epromValid(void) {
    short marker;

    marker = epromReadWord(0);
    if (marker == NODE_ERROR) {
        return TRUE ;
    }
    else {
        return FALSE;
    }
}

void epromInitializeScript(short scriptNumber)
{
    struct eprom_script_def script;
    if (scriptNumber == 0) {
        epromInitializeControl();
    }
    script.type = 0;

```

```

script.id = 0;
script.location = 0;
script.len = 0;
epromWriteScriptNumber(scriptNumber, &script);
}
void epromInitializeControl(void)
{
    epromWriteWord(EPROM_MARKER, NODE_ERROR);
    epromWriteWord(EPROM_IR_SCRIPTID, -1);
}
void epromInitialize(short blnit)
{
    short i;

    if (!epromValid() || blnit == TRUE) {
        if (blnit == FALSE) {
            debugPutstr("epromInvalid epromInnit");
        }
        for (i=0; i < EPROM_NUM_SCRIPTS; i++) {
            epromInitializeScript(i);
        }
    }
}

void epromGetScriptNumber(short scriptNumber, struct eprom_script_def *script)
{
    short address;
    if (!epromValid()) {
        debugPutstr("epromInvalid getScriptNumber");
    }

    if (!epromValid() || scriptNumber >= EPROM_NUM_SCRIPTS || scriptNumber < 0) {
        script->type = -1;
        return;
    }

    address = (scriptNumber * sizeof(struct eprom_script_def)) + sizeof(struct eprom_control_def);
    script->type = epromReadWord((short)(EPROM_SCRIPT_TYPE + address));
    script->id = epromReadWord((short)(EPROM_SCRIPT_ID + address));
    script->location = epromReadWord((short)(EPROM_SCRIPT_LOCATION + address));
    script->len = epromReadWord((short)(EPROM_SCRIPT_LEN + address));
}

short epromGetScript(short scriptType, short scriptId, struct eprom_script_def *script)
{
    short i;
    for (i = 0; i < EPROM_NUM_SCRIPTS; i++) {
        epromGetScriptNumber(i, script);
        if (script->type == scriptType) {
            if (scriptId == -1 || script->id == script->id) {
                return i;
            }
        }
    }
}

```

```

    }
}
script->type = -1;
return -1;
}
void epromWriteScriptNumber(short scriptNumber, struct eprom_script_def *script)
{
    short address;
    if (!epromValid() || scriptNumber >= EPROM_NUM_SCRIPTS || scriptNumber < 0) {
        debugPutstr("invalid epromWrite");
        return;
    }
    address = (scriptNumber * sizeof(struct eprom_script_def)) + sizeof(struct eprom_control_def);
    epromWriteWord((short)(EPROM_SCRIPT_TYPE + address), script->type);
    epromWriteWord((short)(EPROM_SCRIPT_ID + address), script->id);
    epromWriteWord((short)(EPROM_SCRIPT_LOCATION + address), script->location);
    epromWriteWord((short)(EPROM_SCRIPT_LEN + address), script->len);
}

```

```

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 *
 */
#ifndef __fsdinterpreter_h_
#define __fsdinterpreter_h_
#include "fsdtablelarge.h"
#include "istack.h"
#include "rstack.h"
#include "squeue.h"
#define MAX_COMMANDSIZE 16
#define NUMRETURNNODES 8
void fsdint_Initialize(void);
void fsdint_RunInterpreter(void);
void fsdint_initCommands(const char *Commands[], short (*procCall) (short, NodeId, NodeId[], short),
void(*infoCall)(const char *) );
short fsdint_lookupCommand(const char *command);
void fsdint_ButtonsOffInternal(void);
void fsdint_ButtonsOnInternal(void);
void fsdint_ButtonsOff(void);
void fsdint_ButtonsOn(void);
void fsdint_executeButton(const char *sName);
NodeId fsdint_findButton(NodeId startNode, const char *sName, const char *sId) ;
void fsd_getCommandParameter(const char *name, const NodeId commandNode, char *buffer, const short len);
void fsdint_interpretButton(const NodeId buttonNode);
void fsdint_startInterpreter();
void fsdint_fetch(const char *name, char *buffer, const short len);
void fsdint_store(const char *name, const char *value);
void fsdint_increment(const char *name, const short minVal, const short maxVal);
void fsdint_append(const char *name, const char *value);
void fsdint_delay(long seconds, long milliseconds);
void fsdint_hardDelay(long seconds, long milliseconds);
long GetTicks(void);
NodeId fsdint_formBufferNode(NodeId inNode);
NodeId fsdint_getBufferNode(NodeId inNode);
void fsdint_Restart(void);
void fsdint_Reset(void);
#endif

```



```

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 *
 */
#include <pic18.h>
#include "config.h"
#include "mainlinepic.h"
#include <string.h>
#include "support.h"
#include "squeue.h"
#include "delay.h"
#ifdef DEBUG
#include "serial.h"
#endif
#include "fsdtablelarge.h"
#include "fsdinterprettable.h"
near char ALIVECNT;
near char PBCOUNT;
near long TICKS;
near struct {
    unsigned ISC:1;
    unsigned ISA:1;
    unsigned PDONE:1;
    unsigned OLDPB:1;
    unsigned NEWPB:1;
    unsigned dummy:3;
}PBSTATEbits[numButtons];
#ifdef IR_RULES
near unsigned short _duty_1;
#endif
const unsigned char *flashMemory = (unsigned char *)FLASHAREAORIGIN;
#ifdef LCD
const char LCDstr[] = {0x33,0x32,0x28,0x01,0x0c,0x06,0x00,0x00};
const char StrtStr[] = {0x80, 'P', 'u', 's', 'h', ' ', 'P', 'B', ' ', ' ', 0};
const char BYTE_1[] = {0x80, 'B', 'Y', 'T', 'E', '=', ' ', ' ', ' ', 0};
const char Clear1[] = {0x80, ' ', ' ', ' ', ' ', ' ', ' ', ' ', 0};
const char Clear2[] = {0xC0, ' ', ' ', ' ', ' ', ' ', ' ', ' ', 0};
#endif
char TEMPBUFFER[TEMPBUFFER_SIZE];
char TEMPBUFFER2[64];
#ifdef LCD
void InitLCD(void);
void DisplayC(const char *tempPtr);
void DisplayV(char *tempPtr);
void T40(void);
void ByteDisplay(void);

```

```

void DisplayLine(char linenum);
void DisplayErrorMessageV(char *str);
void DisplayErrorMessageC(const char *str);
void ClearScreen(void);
#endif
void Initial(void);
void BlinkAlive(void);
void testFsd(void);
void main (void)
{
    Initial();
    debug (("MainlinePic.c 22Sep03"));
    testFsd();
}
void interrupt InterruptHandlerHigh ()
{
    unsigned char i, buttonState;
#ifdef LABX1 || ARTBOARD || MICROCHIP8720
    unsigned char col, row, key, allCol;
#endif
    if (TMR0IF)
    {
        TMR0IF = 0;
        TICKS += 10;
        if (TICKS < 0) TICKS = 0;

#ifdef LABX1
        key = 0;
        for (row = 0; row < numRows; row++) {
            keypad_port = 0;

            keypad_tris = (1 << row) ^ 0xff;
            asm ("nop");
            asm ("nop");
            allCol = (keypad_port >> 4) & 0xf;
            if (allCol != 3) {
                key = allCol;
                key = key ^ 0xf;
                col = 0;
                for (i=0; i < numCols; i++) {
                    col++;
                    if (key & 1) break;
                    key = key >> 1;
                }
                key = (row * numCols) + col;
                break;
            }
        }
#endif
    }
}
#endif

```

```

#if defined ARTBOARD || MICROCHIP8720
key = 0;
for (row = 0; row < numRows; row++) {

    keypad_port = (1 << row);
    allCol = (keypad_port >> 4);
    if (allCol != 0) {
        key = allCol;
        col = 0;
        for (i=0; i < numCols; i++) {
            col++;
            if (key & 1) {
                break;
            }
            key = key >> 1;
        }
        key = (row * numCols) + col;
        break;
    }
}
#endif
for (i=0; i < numButtons; i++) {
#if defined LABX1 || ARTBOARD || MICROCHIP8720
    if ((key - 1) == i) {
        buttonState = 0;
    }
    else {
        buttonState = 1;
    }
}
#endif
#ifdef MICRODESIGNS

    if (i == 0)
        buttonState = RD2;
    else if (i == 1)
        buttonState = RC5;
    else if (i == 2)
        buttonState = RB2;
    else if (i == 3)
        buttonState = RB3;
    else if (i == 4)
        buttonState = RB4;
    else if (i == 5)
        buttonState = RB5;
    else if (i == 6)
        buttonState = RD3;
#endif

    PBSTATEbits[i].NEWPB = buttonState;

```

```

if (PBSTATEbits[i].OLDPB) {
    if (!PBSTATEbits[i].NEWPB)
        PBCOUNT = PBthres;
}

```

```

if (!PBSTATEbits[i].NEWPB) {
    if (!PBCOUNT)
        if (!PBSTATEbits[i].PDONE){
            PBSTATEbits[i].ISC = 1;
            PBSTATEbits[i].PDONE = 1;

```

```

        }
    }
else
    PBSTATEbits[i].PDONE = 0;

```

```

if (!PBSTATEbits[i].OLDPB)
    if (PBSTATEbits[i].NEWPB) {
        if (PBCOUNT)
            PBSTATEbits[i].ISA = 1;
        PBSTATEbits[i].PDONE = 0;
        PBCOUNT = 0;
    }

```

```

if (PBCOUNT)
    PBCOUNT--;

```

```

if (PBSTATEbits[i].NEWPB)
    PBSTATEbits[i].OLDPB = 1;
else
    PBSTATEbits[i].OLDPB = 0;
}

```

```

BLINK_ALIVE_LED = 0;
if (!(--ALIVECNT)) {
    ALIVECNT = 250;
    BLINK_ALIVE_LED = 1;
}

```

```

        WRITETIMER0(TEN_MS);
    }
}

```

```

void Initial(void)

```

```

{
    char i;
    di();

```

```

    PIE1=0;

```

```
#ifdef ARTBOARD
```

```
CMCON = 0x7;  
ADCON1 = 0b00001111;  
keypad_port = 0;  
keypad_tris = 0xF0;  
TRISA = 0b11100000 ;  
TRISC = 0b10100000 ;  
TRISE = 0b00000000 ;
```

```
#endif
```

```
#ifdef MICROCHIP8720
```

```
CMCON = 0x7;  
ADCON1 = 0b00001111;  
keypad_port = 0;  
keypad_tris = 0xF0;
```

```
PORTC = 0;  
TRISC0 = 0;
```

```
PORTD = 0;  
TRISD = 0;
```

```
#endif
```

```
#ifdef MICRODESIGNS
```

```
ADCON1 = 0b10001110 ;  
PORTC = 0;  
TRISA = 0b11100001 ;  
TRISB = 0b11111100 ;  
TRISC = 0b10100000 ;  
TRISD = 0b00001111 ;  
TRISE = 0b00000000 ;  
PORTA = 0b00010000 ;
```

```
#endif
```

```
#ifdef LABX1
```

```
TRISD = 0 ;
```

```
#endif
```

```
T0CON = 0;  
TMR0IF = 0;  
TMR0IE = 1;  
TMR0IP = 1;  
PSA = 1;  
TMR0ON = 1;  
ALIVECNT = 250;  
TICKS = 0;
```

```
#ifdef IR_RULES
```

```
pwm_osc_init(40000, 50);
```

```
#endif
```

```

for (i=0; i < numButtons; i++) {
    PBSTATEbits[i].ISC = 0;
    PBSTATEbits[i].ISA = 0;
    PBSTATEbits[i].PDONE = 0;
    PBSTATEbits[i].OLDPB = 1;
    PBSTATEbits[i].NEWPB = 0;
}

#ifdef LABX1
    RBPU = 0;
#endif
#if defined MICRODESIGNS || ARTBOARD || MICROCHIP8720
    RBPU = 1;
#endif
#ifdef LCD
    InitLCD();
    DisplayC(StrtStr);
#endif
#ifdef DEBUG
    init_comms();
#endif
    IPEN = 1;

    ei();
}
void BlinkAlive()
{
    RA4 = 1;
    if (!(--ALIVECNT)) {
        ALIVECNT = 250;
        RA4 = 0;
    }
}
#ifdef IR_RULES
static void setDuty(unsigned char X)
{
    CCPR1L = (X >> 2);
    CCP1CON = (CCP1CON & 0xCF) | ((X & 3) << 4);
}
void pwm_osc_init(unsigned long pwm_osc_frequency, unsigned short pwm_osc_dutycycle)
{
    unsigned short _pr2_1;
    double x;
    x = (double)PIC_CLK / (4 * timer_prescale * (double)pwm_osc_frequency);
    _pr2_1 = (short)(x + .5) - 1;
    _duty_1 = (((_pr2_1+1) * 4) * pwm_osc_dutycycle) / 100;
    PR2    = _pr2_1 - 1;
}

```

```
CCP1CON = 0x0C;
```

```
    setDuty(0);
```

```
if (timer_prescale == 1)
```

```
    T2CON = ( T2CON & 0xF8) | 0;
```

```
else if (timer_prescale == 4)
```

```
    T2CON = ( T2CON & 0xF8) | 1;
```

```
else if (timer_prescale == 16)
```

```
    T2CON = ( T2CON & 0xF8) | 2;
```

```
pwm_pin_direction = output_direction;
```

```
TMR2ON = 1;
```

```
}
```

```
void pwm_stop(void)
```

```
{
```

```
    setDuty(0);
```

```
}
```

```
void pwm_start(void)
```

```
{
```

```
    setDuty(_duty_1);
```

```
}
```

```
#endif
```

```
#ifdef LCD
```

```
void InitLCD()
```

```
{
```

```
    char currentChar;
```

```
    const char *tempPtr;
```

```
    DelayMs(100);
```

```
    RE0 = 0;
```

```
    tempPtr = LCDstr;
```

```
    while (*tempPtr) {
```

```
        currentChar = *tempPtr;
```

```
        RE1 = 1;
```

```
        PORTD = currentChar;
```

```
        RE1 = 0;
```

```
        DelayMs(10);
```

```
        currentChar <<= 4;
```

```
        RE1 = 1;
```

```
        PORTD = currentChar;
```

```
        RE1 = 0;
```

```
        DelayMs(10);
```

```
        tempPtr++;
```

```
    }
```

```
}
```

```
void T40(void)
```

```
{
```

```

unsigned char cCount = 7;
while (cCount)
    cCount--;
}
void DisplayC(const char *tempPtr)
{
    char currentChar;
    RE0 = 0;
    while (*tempPtr) {
        currentChar = *tempPtr;
        RE1 = 1;
        PORTD = currentChar;
        RE1 = 0;
        currentChar <<= 4;
        RE1 = 1;
        PORTD = currentChar;
        RE1 = 0;
        T40();
        RE0 = 1;
        tempPtr++;
    }
}
void DisplayV(char *tempPtr)
{
    char currentChar;

    RE0 = 0;
    while (*tempPtr) {
        currentChar = *tempPtr;
        RE1 = 1;
        PORTD = currentChar;
        RE1 = 0;
        currentChar <<= 4;
        RE1 = 1;
        PORTD = currentChar;
        RE1 = 0;
        T40();
        RE0 = 1;
        tempPtr++;
    }
}
#endif
void checkButtons(void)
{
    char i;

    di();
    for (i=0; i < numButtons; i++) {
        if (PBSTATEbits[i].ISC == 1) {
            strcpy(TEMPBUFFER, "Button");

```



```

longToAscii(i, &TEMPBUFFER[6]);

fsdint_executeButton(TEMPBUFFER);
PBSTATEbits[i].ISC = 0;
}
}

ei();
}
#ifdef LCD
char COUNT;
char TEMP;
char TEMPBYTE;
void ByteDisplay(void)
{
    DisplayC(BYTE_1);

    COUNT = 8;
    while (COUNT) {
        TEMP = (TEMPBYTE & 0b00000001);
        TEMP |= 0x30;
        TEMPBUFFER[COUNT] = TEMP;
        TEMPBYTE = TEMPBYTE >> 1;
        COUNT--;
    }
    TEMPBUFFER[0] = 0xc0;
    TEMPBUFFER[9] = 0;
    DisplayV(TEMPBUFFER);
}
void delay_ms(long t)
{
    long start = TICKS;
    while(1) {
        if (TICKS < start) break;
        if ((TICKS - start) > t) break;
    }
}
void ClearScreen(void)
{
    DisplayC(Clear1);
    DisplayC(Clear2);
}
void DisplayLine(char linenum) {
    if (linenum == 1) {
        TEMPBUFFER[0] = (char)0x80;
    } else {
        TEMPBUFFER[0] = (char)0xc0;
    }
    DisplayV(TEMPBUFFER);
}

```

```

void DisplayErrorMessageV(char *str)
{
    char ch;
    char *p;
    short len;
    char linenum = 1;
    RA1 = 1;
    ClearScreen();
    while (linenum < 3) {
        p = &TEMPBUFFER[1];
        len = 1;
        while (1) {
            ch = *str++;
            if (len == 9 || ch == 0) break;
            *p++ = ch;
            len++;
        }
        *p = 0;
        if (linenum == 1) {
            DisplayLine(linenum);
            if (ch != 0) str--;
            linenum++;
        }
        else {
            DisplayLine(linenum);
            linenum++;
        }
        if (ch == 0) break;
    }
    DelayS(5);
    RA1 = 0;
}

void DisplayErrorMessageC(const char *str)
{
    char temp[TEMPBUFFER_SIZE];

    ClearScreen();
    if (strlen(str) > TEMPBUFFER_SIZE - 1) {
        strncpy(temp, str, TEMPBUFFER_SIZE - 1);
        temp[TEMPBUFFER_SIZE - 1] = 0;
    } else {
        strcpy(temp, str);
    }
    DisplayErrorMessageV(temp);
}

#endif

```

```
/*  
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors  
 *  
 * Copyright (C) 2002, Arthur Gravina. Confidential.  
 *  
 * Arthur Gravina <art@agravina.com>  
 *  
 */
```

```
#ifndef __config_h_  
#define __config_h_  
#define target_clock PIC_CLK  
#define timer_prescale 1  
#define output_direction 0  
#define input_direction 1  
#define pwm_pin_direction TRISC2  
#define PBthres 10  
#define MICROCHIP8720 1  
#ifdef LABX1  
#define PIC_CLK 10000000  
#define TEN_MS 65536-25000+0+2  
#define BLINK_ALIVE_LED RD0  
#define keypad_port PORTB  
#define keypad_tris TRISB  
#define numButtons 16  
#define numRows 4  
#define numCols 2  
#endif  
#ifdef ARTBOARD  
#define PIC_CLK 10000000  
#define TEN_MS 65536-25000+0+2  
#define BLINK_ALIVE_LED RA2  
#define keypad_port PORTF  
#define keypad_tris TRISF  
#define numButtons 16  
#define numRows 4  
#define numCols 4  
#endif  
#ifdef MICROCHIP8720  
#define PIC_CLK 20000000  
#define TEN_MS 65536-50000+0+2  
#define BLINK_ALIVE_LED RD0  
#define BEEP_LED RD1  
#define keypad_port PORTF  
#define keypad_tris TRISF  
#define numButtons 16  
#define numRows 4  
#define numCols 4  
#endif  
#ifdef MICRODESIGNS
```

```
#define TEN_MS 65536-25000+0+2
#define BLINK_ALIVE_LED RA1
#define numButtons 7
#endif
#endif
```

The following is the scripting API currently implmented.

The PushPlay basic command set

+++++

PushPlay

Defines a new script. Must be first element in a script.

Parameters:

" scriptType. 1 = Main Script, 2 = Infrared Driver Script, 3=Compiled Infrared data

" scriptId. A unique id for this scriptType.

Example:

```
<PushPlay scriptType="1" scriptId="00001">
```

```
</PushPlay
```

+++++

Button

Defines the commands that will be executed when this button is pressed.

Parameters:

" id. Button0, Button1. Button0 is the first button, Button1 is the second and so on.

A unique id is "Startup". This is executed when the script is first started.

" name. A descriptive name.

Example:

```
<Button id="Startup" name="Startup">
```

```
<Button id="Button15" name="Restart"
```

+++++

Trick

Define a macro. This is a collection of commands that will be executed multiple times. You can pass it parameters to modify its behavior.

Parameters:

" id. The name that will be used by TrickPlay to call this macro.

Example:

```
<Trick id="monkeyGraphic">
```

+++++

TrickPlay

Call a Trick. Pass it any number of parameters. The commands within the macro will reference these passed parameters.

Parameters:

" id. The name of the macro as defined by Trick.

Example:

```
<TrickPlay id="monkeyGraphic">
```

+++++

If

A conditional command. Will execute the block of commands if the condition is true.

Parameters:

" id. The name of a variable. May be preceded by an '@' for indirect addressing

" oper. The operation to be tested. Operators are: eq, neq, gt, lt.

" value. The value to compare to the variable.

"

Example:

```
<If id="ElephantCounter" oper="eq" value="1">
```

+++++

Set

Set a variable to a value.

Parameters:

" id. The name of a variable.

" value. The value to compare to the variable.

Example:

```
<Set id="playstate" value="0"/>
```

+++++

Increment

Will increment a variable with a range. When the maximum limit is reached will restart a minimum value.

Parameters:

" id. The name of a variable.

" min. The starting value when max is reached

" max. The maximum value variable will be incremented to.

Example:

```
<Increment id="MonkeyCounter" min="0" max="2"/>
```

+++++

Append

Append a string value to a variable

Parameters:

" id. The name of a variable.

" value. The string to append.

Example:

```
<Append id="scriptId" value="1" />
```

+++++

ButtonsOn

Allow a new button press to interrupt the command currently being processed.

Parameters: none

Example:

```
<ButtonsOn/>
```

+++++

ButtonsOff

Don't allow a new button press to interrupt the command currently being processed.

Parameters: none

Example:

```
<ButtonsOff/>
```

+++++

Sleep

Delay for a time period.

Parameters:

" milliseconds. The number of milliseconds to delay.

" seconds. The number of seconds to delay.

Example:

```
<Sleep seconds="3"/>
```

The following commands are specific to DVD devices.

+++++

Menu

Stops title playback and displays the top (or root) menu for the current title.

Parameters: none

Example: <Menu/>

+++++

Title

Stops title playback and displays the title menu.

Parameters: none

Example: <Title/>

+++++

Resume

Returns to playback mode from menu mode at the same title position as when the menu was invoked.

Parameters: none

Example: <Resume/>

+++++

Back

Returns the display from a submenu to its parent menu.

Parameters: none

Example: <Back/>

+++++

Play

Causes the DVD to start playing, or resumes play of a paused item.

Parameters: none

Example: <Play />

+++++

Stop

Stops the playing of the DVD.

Parameters: none

Example: <Stop />

+++++

Pause

Pauses the playing of the chapter.

Parameters: none

Example: <Pause />

+++++

NextChapter

Seeks and plays the next chapter. Will loop.

Parameters: none

Example: <NextChapter />

+++++

PrevChapter

Seeks and plays the previous chapter. Will loop.

Parameters: none

Example: <PrevChapter />

+++++

TitleSeek

Seeks and plays the first chapter in the title. Title number is 1 to 99.

Parameter:

" Title. The title number to seek to

Example:

<TitleSeek title="3" />

+++++

ChapterSeek

Seeks and plays the chapter in the current title. Chapter number is 1 to 999.

Parameter:

" chapter. The chapter number to seek to

Example:

```
<ChapterSeek chapter="3" />
```

+++++

TimeSeek

Seeks to a specific time on the DVD. Specify hour,minute,second.

Parameter:

" time. The hour, minute and second to seek to.

Example:

```
<TimeSeek time="000757"/>
```

+++++

FastForward

start fast forwarding

Parameters: none

Example: <FastForward />

+++++

FastReverse

start fast reversing

Parameters: none

Example: <FastReverse />

+++++

PushButton

Simulate a button press on a remote control device

Parameters:

" id. The name of the button. Is device dependent.

Example:

```
<PushButton id="SEARCH" />
```

+++++

PushNumbers

Simulate pressing the number buttons.

Parameters:

" value. The number string to send.

Example:

```
<PushNumbers value="24" />
```

+++++

The following is a complete script example.

```
<!-- World Animals No Interrupting -->
```

```
<PushPlay scriptType="1" scriptId="00001">
```

```
<!-- if 'playstate' is 0, then resume and set playstate to 1 -->
```

```
<Trick id="checkPlaystate" >
```

```
<!-- are we playing -->
```

```
<If id="playstate" oper="eq" value="0">
```

```
<Resume/>
```

```
<Set id="playstate" value="1"/>
```

```
</If>
```

```
</Trick>
```

```
<!-- All of the above is common to all Animals -->
```

```
<!-- MONKEY -->
```

```
<!-- Monkey Graphic-->
```



```
<Trick id="monkeyGraphic">
  <ChapterSeek chapter="7" />
  <TimeSeek time="000716"/>
  <Sleep seconds="3"/>
</Trick>
<!-- Monkey live -->
<Trick id="monkeyLive">
  <ChapterSeek chapter="7" />
  <TimeSeek time="000757"/>
  <Sleep seconds="50"/>
</Trick>
<!-- M5 Monkey Puppet Sequence -->
<Trick id="monkeyPuppet">
  <ChapterSeek chapter="7" />
  <TimeSeek time="000740"/>
  <Sleep seconds="16"/>
</Trick>
<!-- FISH -->
<!-- Fish Live -->
<!-- Fish -->
<Trick id="fishGraphic">
  <TimeSeek time="001055"/>
  <Sleep seconds="4"/>
</Trick>

<Trick id="fishLive">
  <TimeSeek time="001244"/>
  <Sleep seconds="41"/>
</Trick>

<Trick id="fishPuppet">
  <TimeSeek time="001356"/>
  <Sleep seconds="26"/>
</Trick>

<!-- TROPICAL BIRD -->
<!-- Tropical Bird Graphic -->
<Trick id="tropicalBirdGraphic">
  <TimeSeek time="000326"/>
  <Sleep seconds="3"/>
</Trick>
<!-- TB3 Tropical Bird Live -->
<Trick id="tropicalBirdLive">
  <TimeSeek time="000552"/>
  <Sleep seconds="62"/>
</Trick>
<!-- TropicalBird Puppet -->
<Trick id="tropicalBirdPuppet">
  <TimeSeek time="000655"/>
  <Sleep seconds="20"/>
```

```
</Trick>
<!--          SEA TURTLE          -->
<!-- SeaTurtle Graphic -->
<Trick id="turtleGraphic">
  <TimeSeek time="001107"/>
  <Sleep seconds="3"/>
</Trick>
```

```
<!-- Sea Turtle Live -->
<Trick id="turtleLive">
  <TimeSeek time="001141"/>
  <Sleep seconds="30"/>
</Trick>
```

```
<!-- Sea Turtle Puppet -->
<Trick id="turtlePuppet">
  <TimeSeek time="001112"/>
  <Sleep seconds="18"/>
</Trick>
```

```
<!--          ELEPHANT          -->
<!-- Elephant Graphic -->
<Trick id="elephantGraphic">
  <TimeSeek time="001512"/>
  <Sleep seconds="3"/>
</Trick>
<Trick id="elephantLive">
  <TimeSeek time="001600"/>
  <Sleep seconds="61"/>
</Trick>
<Trick id="elephantPuppet">
  <TimeSeek time="001518"/>
  <Sleep seconds="17"/>
</Trick>
```

```
<Button id="Startup" name="Startup">
  <Set id="ElephantCounter" value="0"/>
  <Set id="SeaTurtleCounter" value="0"/>
  <Set id="TropicalBirdCounter" value="0"/>
  <Set id="MonkeyCounter" value="0"/>
  <Set id="FishCounter" value="0"/>
  <TitleSeek title="2" />
  <Sleep seconds="1" />
  <ChapterSeek chapter="4" />
</Button>
```

```
<!-- Restart Game. This will clear everything, and startover -->
<Button id="Button15" name="Restart">
  <Restart />
</Button>
<!-- Reset Game. 1st time clear Gamescript and startover. -->
<Button id="Button14" name="Reset">
  <Reset />
```

```

</Button>
<!-- Get Ir Script. -->
<Button id="Button13" name="GetIrScript">
  <GetIrScript />
</Button>
<!-- Monkey Button -->
<Button id="Button0" name="Monkey">
<!-- <ButtonsOff/> -->

<!-- increment the counter pre-trickplay -->
<Increment id="MonkeyCounter" min="0" max="2"/>
<!-- first time -->
<If id="MonkeyCounter" oper="eq" value="0">
  <TrickPlay id="monkeyGraphic" />
  <Pause/>
  <Set id="playstate" value="0"/>

</If>
<!-- second time -->
<If id="MonkeyCounter" oper="eq" value="1">
  <TrickPlay id="monkeyLive" />
  <Pause/>
  <Set id="playstate" value="0"/>
</If>
<!-- third time -->
<If id="MonkeyCounter" oper="eq" value="2">
  <TrickPlay id="monkeyPuppet" />
  <Pause/>
  <Set id="playstate" value="0"/>
</If>

<!-- <ButtonsOn/> -->
</Button>
<!-- Fish Button -->
<Button id="Button1" name="Fish">
<!-- <ButtonsOff/> -->
<Increment id="FishCounter" min="0" max="2"/>

<!-- first time -->
<If id="FishCounter" oper="eq" value="0">
  <TrickPlay id="fishGraphic" />
  <Pause/>
  <Set id="playstate" value="0"/>

</If>
<!-- second time -->
<If id="FishCounter" oper="eq" value="1">
  <TrickPlay id="fishLive" chapter="16" seconds="3" />
  <Pause/>
  <Set id="playstate" value="0"/>

```

```

</If>
<!-- third time -->
<If id="FishCounter" oper="eq" value="2">
  <TrickPlay id="fishPuppet" />
  <Pause/>
  <Set id="playstate" value="0"/>
</If>

<!-- <ButtonsOn/> -->
</Button>

<!-- TropicalBird Button -->
<Button id="Button2" name="Tropical Bird">
<!-- <ButtonsOff/> -->
<Increment id="TropicalBirdCounter" min="0" max="2"/>

<!-- first time -->
<If id="TropicalBirdCounter" oper="eq" value="0">
  <TrickPlay id="tropicalBirdGraphic" />
  <Pause/>
  <Set id="playstate" value="0"/>

</If>
<!-- second time -->
<If id="TropicalBirdCounter" oper="eq" value="1">
  <TrickPlay id="tropicalBirdLive" />
  <Pause/>
  <Set id="playstate" value="0"/>
</If>
<!-- third time -->
<If id="TropicalBirdCounter" oper="eq" value="2">
  <TrickPlay id="tropicalBirdPuppet" />
  <Pause/>
  <Set id="playstate" value="0"/>
</If>

<!-- <ButtonsOn/> -->
</Button>
<!-- SeaTurtle Button -->
<Button id="Button3" name="Sea Turtle">
<!-- <ButtonsOff/> -->
<Increment id="SeaTurtleCounter" min="0" max="2"/>

<!-- first time -->
<If id="SeaTurtleCounter" oper="eq" value="0">
  <TrickPlay id="turtleGraphic" />
  <Pause/>
  <Set id="playstate" value="0"/>

</If>

```

<!-- second time no Guess for SeaTurtle ???? -->

<If id="SeaTurtleCounter" oper="eq" value="1">

<TrickPlay id="turtleLive" />

<Pause/>

<Set id="playstate" value="0"/>

</If>

<!-- third time -->

<If id="SeaTurtleCounter" oper="eq" value="2">

<TrickPlay id="turtlePuppet" />

<Pause/>

<Set id="playstate" value="0"/>

</If>

<!-- <ButtonsOn/> -->

</Button>

<!-- Elephant Button -->

<Button id="Button4" name="Elephant">

<!-- <ButtonsOff/> -->

<Increment id="ElephantCounter" min="0" max="2"/>

<!-- first time -->

<If id="ElephantCounter" oper="eq" value="0">

<TrickPlay id="elephantGraphic" />

<Pause/>

<Set id="playstate" value="0"/>

</If>

<!-- second time -->

<If id="ElephantCounter" oper="eq" value="1">

<TrickPlay id="elephantLive" />

<Pause/>

<Set id="playstate" value="0"/>

</If>

<!-- third time -->

<If id="ElephantCounter" oper="eq" value="2">

<TrickPlay id="elephantPuppet" />

<Pause/>

<Set id="playstate" value="0"/>

</If>

<!-- <ButtonsOn/> -->

</Button>

</PushPlay>

```
/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#ifndef __rstack_h_
#define __rstack_h_
#define RMAXDIM 30
#define ISTKERROR -3333
typedef short RElementType;
void RPush(const RElementType f);
RElementType RPop(void);
RElementType RPeek(const int Item);
int RCount();
void EmptyRStack(void);
#endif
```

```

/*
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 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include <pic18.h>
#include "tablereadwrite.h"
extern char TEMPBUFFER2[];
static void fsd_initiate_write(void);
static void fsd_flash_write(far unsigned char * source_addr,unsigned char length,far unsigned char * dest_addr);
static unsigned char fsd_flash_read(unsigned long addr);
static void fsd_initiate_write(void)
{
    WREN=1;
    CARRY=0;if(GIE)CARRY=1;GIE=0;
    DC=0;if(PEIE)DC=1;PEIE=0;
    EECON2=0x55;
    EECON2=0xAA;
    WR=1;
    asm("\tNOP");
    if(CARRY)GIE=1;
    if(DC)PEIE=1;
    WREN=0;
}
static void fsd_flash_write(far unsigned char * source_addr,unsigned char length,far unsigned char * dest_addr)
{
    unsigned char index;
    unsigned char offset;
#ifdef _18F242 || defined(_18F252) || defined(_18F442) || defined(_18F452)
    unsigned char saved1,saved2,saved3;
#endif
    offset=(unsigned char)dest_addr & 0x3F;
    dest_addr-=offset;

    while(length)
    {
        for(index=0;index<64;index++)
        {
            if((index>=offset)&&(length))
            {
                TEMPBUFFER2[index]=*(source_addr++);
                length--;
            }
            else
                TEMPBUFFER2[index]=*(dest_addr+index);
        }
    }
}

```

```

}
TBLPTR=dest_addr;
EECON1=0x94;
fsd_initiate_write();

for(index=0;index<64;index++)
{
    TABLAT=TEMPBUFFER2[index];
#ifdef _18F242 || defined(_18F252) || defined(_18F442) || defined(_18F452)
    saved1=INTCON; INTCN=0;
    saved2=INTCON2; INTCN2=0;
    saved3=INTCON3; INTCN3=0;
    TEMPBUFFER2[0]=PIE1; PIE1=0;
    offset=PIE2; PIE2=0;
#endif
    if(index==0)
        asm("\tTBLWT*");
    else
        asm("\tTBLWT+*");
#ifdef _18F242 || defined(_18F252) || defined(_18F442) || defined(_18F452)
    INTCN=saved1;
    INTCN2=saved2;
    INTCN3=saved3;
    PIE1=TEMPBUFFER2[0];
    PIE2=offset;
#endif
    if((index & 7)==7)
    {
        fsd_initiate_write();
    }
}
dest_addr+=64;
offset=0;
}
}

static unsigned char fsd_flash_read(unsigned long addr)
{
    TBLPTRL=((addr)&0xFF);
    TBLPTRH=(((addr)>>8)&0xFF);
    TBLPTRU=(((addr)>>8)>>8);
    asm("\tTBLRD*");
    return TABLAT;
}

void TableWrite(unsigned char *dest, unsigned char *source, unsigned short Count)
{
    unsigned short index=0;
    unsigned char thisCount;

    while(index < Count) {

```



```

if ((index + 64) <= Count) {
    thisCount = 64;
    index += 64;
}
else {
    thisCount = Count - index;
    index += Count - index ;
}
fsd_flash_write(source, thisCount, dest );
source += thisCount;
dest += thisCount;
}
}
void TableRead(unsigned char *dest, unsigned char *source, unsigned short Count)
{
    unsigned char data;
    while(Count > 0) {
        data = fsd_flash_read((unsigned long)source++);
        *dest++ = data;
        Count--;
    }
}

```

```

/*
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 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#ifdef IR_UNIV_CHIP
void ir_Initialize(void);
void ir_setDeviceNumber(short num);
unsigned char ir_sendWords(unsigned char code);
void ir_sendNumbersString(const char *sNum);
unsigned char ir_lookupButton(const char *buttonName);
NodeId ir_findMacro(short butNumber, const char *butName);
struct flaglist {
    const char *name;
    int flag;
};
#define MAXIRCOMMAND 29
#define TITLE    35
#define MENU     33
#define PLAY     24
#define STOPDVD  25
#define PAUSE    26
#define STEP     0
#define PREVCHAPTER 31
#define NEXTCHAPTER 30
#define SEARCH   32
#define NAV_UP   38
#define NAV_DOWN 39
#define NAV_LEFT 40
#define NAV_RIGHT 41
#define REWIND   27
#define FORWARD  28
#define NUM_1    9
#define NUM_2    10
#define NUM_3    11
#define NUM_4    12
#define NUM_5    13
#define NUM_6    14
#define NUM_7    15
#define NUM_8    16
#define NUM_9    17
#define NUM_0    18
#define NUM_TEN_PLUS 20
#define POWER    1
#define MAXIRMACRO 3
#define CHAPTERSEEK 0

```

```
#define TITLESEEK 1
#define TIMESEEK 2
#endif
```

The following files contain the compiler for PushPlay: CompilelrCodes.vbp; CompilelrCodes.vbw; Form1.frm; FSDCompileScript.cls; and FastSimpleDocument.bas.

These files are meant to be compiled under Visual Basic 6.0.

The use interface is self explanatory.

Navigate to the directory desired, where the PushPlay scripts are stored.

Click on the Compile Button.

All files will be compiled into PushPlay's proprietary format.

The file will have a ".fsd" appended to them.

```

/*
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 *
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 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#ifndef __eprom_h_
#define __eprom_h_
#include "support.h"
#include <stddef.h>
#define EPROM_NUM_SCRIPTS 3
struct eprom_script_def {
    WORD type;
    WORD id;
    WORD location;
    WORD len;
};
#define EPROM_SCRIPT_TYPE  offsetof(struct eprom_script_def, type)
#define EPROM_SCRIPT_ID   offsetof(struct eprom_script_def, id)
#define EPROM_SCRIPT_LOCATION  offsetof(struct eprom_script_def, location)
#define EPROM_SCRIPT_LEN   offsetof(struct eprom_script_def, len)
struct eprom_control_def {
    WORD marker;
    WORD irScriptId;
};
#define EPROM_MARKER  offsetof(struct eprom_control_def, marker)
#define EPROM_IR_SCRIPTID  offsetof(struct eprom_control_def, irScriptId)
short epromValid(void);
void epromInitializeScript(short scriptNumber);
void epromInitializeControl(void);
void epromInitialize(short blnit);
void epromWriteWord(short address, short data);
short epromReadWord(short address);
void epromGetScriptNumber(short scriptNumber, struct eprom_script_def *script);
short epromGetScript(short scriptType, short scriptId, struct eprom_script_def *script);
void epromWriteScriptNumber(short scriptNumber, struct eprom_script_def *script);
#endif

```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#include "istack.h"
#ifdef PIC
near
#endif
static short sp=0;
static ElementType val[MAXDIM];
void IPush(const ElementType f)
{
    if (sp<MAXDIM) {
        val[sp++]=f;
    }
    else {
        debugPutstrHi("ISTack Oflow");
    }
}
ElementType IPop(void)
{
    if (sp>0)
        return val[--sp];
    else {
        return ISTKERROR;
    }
}
ElementType IPeek(const ElementType Item)
{
    if (Item >= 0 && Item < sp)
        return val[sp - Item - 1];
    else {
        return ISTKERROR;
    }
}
short ICount()
{
    return sp;
}
void EmptyIStack(void)
{
    sp = 0;
}

```

FSDCompileScript = 72, 7, 685, 428,

FastSimpleDocument = 120, 134, 733, 555,

Form1 = 66, 87, 679, 508, Z, 21, 4, 634, 425, C

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "fsdinterpretable.h"
#ifdef IR_RULES
#include "sendircommon.h"
#include "sendirrules.h"
#endif
#ifdef IR_UNIV_CHIP
#include "sendirunivchip.h"
#endif
#include "eprom.h"
#include "beep.h"
extern char TEMPBUFFER[];
extern short currentScriptBuffer;
static const char *commands[42] = {"TopMenu", "TitleMenu", "Resume", "Back",
    "Play", "Stop", "Pause", "Next", "Previous", "TitleSeek", "ChapterSeek",
    "language", "StepForward", "StepReverse", "FastForward", "FastReverse",
    "Set", "Get", "ButtonsOnInternal", "ButtonsOffInternal", "Restart", "Reset",
    "GetIrScript", "SetIrScript", "Append", "", "", "If",
    "Button", "TrickPlay", "Sleep", "TimeSeek", "Increment",
    "SleepHard", "PushButton", "PushNumbers", "ButtonsOn", "ButtonsOff",
    "IrRaw", "IrRawPart", "IrSend",
    NULL };
static short procCommand(short iCommand, NodeId commandNode, NodeId buttons[], short len);
static void info(const char *msg);
void PushPlayInitialize(void)
{
    fsdint_initCommands(commands, procCommand, info);
}
static short procCommand(short iCommand, NodeId node, NodeId buttons[], short len)
{
    TextLoc loc1, loc2, loc3;
    PtrTextLoc sValue, sValue2, sCommand;
    int ticks;
    short iMinValue, iMaxValue, count, iSecond, iMillisecond;
    loc1 = fsd_slotTextBlock();
    loc2 = fsd_slotTextBlock();
    loc3 = fsd_slotTextBlock();
    sValue = fsd_fetchTextLocPtr(loc1);
    sValue2 = fsd_fetchTextLocPtr(loc2);
    sCommand = fsd_fetchTextLocPtr(loc3);
    count = 0;
    if (sValue != NULL && sValue2 != NULL && sCommand != NULL) {
        ticks = GetTicks() & 0x7FFF;
    }
}

```



```

fsd_getNodeName(node, sCommand, CHAR_BUFFERSIZE);
if (iCommand != 39) {
    debug((" %d Command %s %d:", ticks, sCommand, currentScriptBuffer ));
}
switch (iCommand) {
    case 0:
        ir_sendWords(MENU) ;
        break;
    case 1:
        ir_sendWords(TITLE) ;
        break;
    case 2:
        ir_sendWords(PLAY) ;
        break;
    case 3:
        ir_sendWords(MENU) ;
        break;
    case 4:

        ir_sendWords(PLAY) ;
        break;
    case 5:
        ir_sendWords(STOPDVD) ;
        break;
    case 6:
        ir_sendWords(PAUSE) ;
        break;
    case 7:
        ir_sendWords(NEXTCHAPTER) ;
        break;
    case 8:
        ir_sendWords(PREVCHAPTER) ;
        break;
    case 9:
        fsdint_fetch("title", sValue, CHAR_BUFFERSIZE);
        debugHi((" %s", sValue));

        buttons[0] = ir_findMacro(TITLESEEK, "TITLESEEK");
        if (buttons[0] != NODE_ERROR) count = 1;
        break;
    case 10:
        fsdint_fetch("chapter", sValue, CHAR_BUFFERSIZE);
        debugHi((" %s", sValue));

        buttons[0] = ir_findMacro(CHAPTERSEEK, "CHAPTERSEEK");
        if (buttons[0] != NODE_ERROR) count = 1;
        break;
    case 16:
        fsdint_fetch("id", sValue, CHAR_BUFFERSIZE);
        fsdint_fetch("value", sValue2, CHAR_BUFFERSIZE);

```

```

debugHi(("s=%s", sValue ,sValue2));
fsdint_store (sValue, sValue2);
break;
case 18:
    fsdint_ButtonsOnInternal();
    break;
case 19:
    fsdint_ButtonsOffInternal();
    break;
case 20:
    fsdint_Restart();
    break;
case 21:
    fsdint_Reset();
    break;
case 22:
    fsdint_GetIrScript();
    break;
case 23:
    fsdint_fetch("value", sValue, CHAR_BUFFERSIZE);
        iSecond = fsd_getInteger(sValue);
    fsdint_SetIrScript(iSecond);
    break;
case 24:
    fsdint_fetch("id", sValue, CHAR_BUFFERSIZE);
    fsdint_fetch("value", sValue2, CHAR_BUFFERSIZE);
    fsdint_append (sValue, sValue2);
    fsdint_fetch(sValue, sValue2, CHAR_BUFFERSIZE);
    keypressBeep();
    debugHi(("s=%s", sValue ,sValue2));
    break;
case 30:
    fsdint_fetch("seconds", sValue, CHAR_BUFFERSIZE);
        iSecond = fsd_getInteger(sValue);
    fsdint_fetch("milliseconds", sValue, CHAR_BUFFERSIZE);
    iMillisecond = fsd_getInteger(sValue);
    debugHi((" %d %d", iSecond, iMillisecond ));
    fsdint_delay( iSecond, iMillisecond);
    break;
case 31:
        fsdint_fetch("time", sValue, CHAR_BUFFERSIZE);
    debugHi(("s",sValue));

    buttons[0] = ir_findMacro(TIMESEEK, "TIMESEEK");
    if (buttons[0] != NODE_ERROR) count = 1;
    break;
case 32:
    fsdint_fetch("id", sValue, CHAR_BUFFERSIZE);
    fsdint_fetch("min", sValue2, CHAR_BUFFERSIZE);
    iMinValue = fsd_getInteger(sValue2);

```

```

    fsdint_fetch("max", sValue2, CHAR_BUFFERSIZE);
    iMaxValue = fsd_getInteger(sValue2);
    debugHi(("s %d %d", sValue, iMinValue, iMaxValue));
    fsdint_increment(sValue, iMinValue, iMaxValue);
    break;
case 33:
    fsdint_fetch("seconds", sValue, CHAR_BUFFERSIZE);
    iSecond = fsd_getInteger(sValue);
    fsdint_fetch("milliseconds", sValue, CHAR_BUFFERSIZE);
    iMillisecond = fsd_getInteger(sValue);
    debugHi(("d %d", iSecond, iMillisecond ));
    fsdint_hardDelay( iSecond, iMillisecond);
    break;
case 34:
    fsdint_fetch("id", sValue, CHAR_BUFFERSIZE);
    debugHi(("s", sValue));

    iSecond = (short)ir_lookupButton(sValue);
    ir_sendWords((char)iSecond) ;
    break;
case 35:
    fsdint_fetch("value", sValue, CHAR_BUFFERSIZE);
    debugHi(("s", sValue));

    ir_sendNumbersString(sValue);
    break;
case 36:
    fsdint_ButtonsOn();
    break;
case 37:
    fsdint_ButtonsOff();
    break;
case 38:
    break;
case 39:
    break;
case 40:
    break;
default:
    debugPutstrHi("Command not implemented");
}
}
else {
    info("No textLoc avail");
}
fsd_scratchTextBlock(loc1);
fsd_scratchTextBlock(loc2);
fsd_scratchTextBlock(loc3);
return count;
}

```

```
static void info(const char *msg)
{
    debugPutstrHi(msg);
}
```

```
/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#ifndef __mainlinepic_h_
#define __mainlinepic_h_
void pwm_osc_init(unsigned long pwm_osc_frequency, unsigned short pwm_osc_dutycycle);
void pwm_stop(void);
void pwm_start(void);
void DisplayErrorMessageV(char *str);
void DisplayErrorMessageC(const char *str);
#endif
```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#include "rstack.h"
#ifdef DEBUG
#include <stdio.h>
#endif
#include <string.h>
#include "fsdtablelarge.h"
#ifdef PIC
#include "delay.h"
#include "i2c_ccs.h"
#include "tablereadwrite.h"
#else
#include "pcromchip.h"
#endif
#include "eprom.h"
#include "beep.h"
const char EMPTY_STRING[] = "";
extern char TEMPBUFFER[];
extern short devTicks;
extern const unsigned char *flashMemory;
static struct header_def header[NUMSCRIPTS];
#ifdef PIC
near
#endif
unsigned short scriptBuffer[NUMSCRIPTS];
#ifdef PIC
near
#endif
short  numScriptBuffers;
#ifdef PIC
near
#endif
short  currentScriptBuffer;
#ifdef PIC
near
#endif
short  irScriptBuffer;
#ifdef PIC
near
#endif
short  mainScriptBuffer;
#ifdef PIC

```

```

near
#endif
short offsetFlashMemory = 0;
struct node_def dynamicNodes[NUMDYNAMICNODES];
short maxNode;
struct attribute_def dynamicAttributes[NUMDYNAMICATTRIBUTES];
short maxAttribute;
char dynamicTextBuffer[SIZETEXTBUFFER];
TextLoc maxTextLoc;
static void *fetchNodePtr(const NodeId nodeId, const short offset);
static void *fetchAttributePtr(const NodeId nodeId, const short offset);
void fsd_Initialize(void)
{
    short i;
    for (i=0; i < NUMSCRIPTS; i++) {
        scriptBuffer[i] = 0;
    }
#ifdef PIC
    pc_Init();
#endif

    epromInitialize(FALSE);
    numScriptBuffers = 0;
    currentScriptBuffer = 0;
    offsetFlashMemory = 0;
}
void fsd_LoadMainScript(void)
{
    struct eprom_script_def script;
    short scriptType, scriptId;
    scriptType = MAINSCRIPT;

    if (devTicks == -1) {
        scriptId = IRGETSCRIPTID;
    }
    else {
        scriptId = -1;
    }
    script.location = -1;

    if (epromGetScript(scriptType, scriptId, &script) == -1) {
        fsd_setScriptBuffer(scriptType, scriptId);
    } else {
        fsd_setScriptBufferNoLoad(&script);
    }
}
void fsd_setMainScriptBuffer(void)
{
    currentScriptBuffer = mainScriptBuffer;
}

```

```

void fsd_switchRomBuffer(short newRomBuffer)
{
    RPush(currentScriptBuffer);
    currentScriptBuffer = newRomBuffer;
}
void fsd_unswitchRomBuffer()
{
    currentScriptBuffer = RPop();
}
static void *fetchNodePtr(const NodeId nodeId, const short offset)
{
    NodeId node;
    long address;

    if (nodeId < 0 ) {
        node = abs(nodeId) - 2;
        if (node >= NUMDYNAMICNODES || node < 0) return (void *)NODE_ERROR;
        return (unsigned char *)&dynamicNodes[node] + offset;
    } else {
        node = nodeId;
        if (node >= header[currentScriptBuffer].numNodes || node < 0) {
            return (void *)NODE_ERROR;
        }
        address = scriptBuffer[currentScriptBuffer];
        address += header[currentScriptBuffer].nodeOffset;
        address += node * sizeof(struct node_def);
        address += offset;
        return (void *)address;
    }
}
static void *fetchAttributePtr(const NodeId nodeId, const short offset)
{
    NodeId node;
    long address;

    if (nodeId < 0 ) {
        node = abs(nodeId) - 2;
        if (node >= NUMDYNAMICATTRIBUTES || node < 0) return (void *)NODE_ERROR;
        return (unsigned char *)&dynamicAttributes[node] + offset;
    } else {
        node = nodeId;
        if (node >= header[currentScriptBuffer].numAttributes || node < 0) return (void *)NODE_ERROR;
        address = scriptBuffer[currentScriptBuffer];
        address += header[currentScriptBuffer].attributeOffset;
        address += node * sizeof(struct attribute_def);
        address += offset;
        return (void *)address;
    }
}
void *fsd_fetchTextLocPtr(const TextLoc locText)

```



```

{
    TextLoc thisLoc;
    long address;

    if (locText < 0) {
        thisLoc = abs(locText) - 2;
        if (thisLoc < 0 || thisLoc >= SIZETEXTBUFFER - 1) return (void *)NODE_ERROR;
        return (unsigned char *)&dynamicTextBuffer[thisLoc];
    }
    else {
        thisLoc = locText;
        if (thisLoc < 0 || thisLoc >= header[currentScriptBuffer].lenTextArea - 1) return (void *)NODE_ERROR;
        address = scriptBuffer[currentScriptBuffer];
        address += header[currentScriptBuffer].textAreaOffset;
        address += thisLoc;
        return (void *)address;
    }
}

NodeId fsd_fetchNode(PtrNode pNode, NodeId node)
{
    void *address;
    address = fetchNodePtr(node, 0);
    if (address == (void *)NODE_ERROR) return NODE_ERROR;
    if (node < 0) {

        memcpy(pNode, address, sizeof(Node));
    }
    else {

#ifdef SCRIPT_IN_FLASH
        memcpy(pNode, flashMemory+(long)address, sizeof(Node));
#else
        ROM_Read((int)address, (char *)pNode, sizeof(Node));
#endif
    }
    return node;
}

NodeId fsd_fetchNodeId(const NodeId node, const short offset)
{
    unsigned char*address;
    NodeId word;
    address = fetchNodePtr(node, offset);
    if (address == (void *)NODE_ERROR) return NODE_ERROR;
    if (node < 0) {

        memcpy(&word, address, sizeof(WORD));
    }
    else {

#ifdef SCRIPT_IN_FLASH

```

```

    memcpy(&word, flashMemory+(long)address, sizeof(WORD));
#else
    word = ROM_ReadWord((int)address);
#endif

}
return word;
}

NodeId fsd_fetchAttribute(PtrAttribute pAttribute, NodeId attribute)
{
    void *address;
    address = fetchAttributePtr(attribute, 0);
    if (address == (void *)NODE_ERROR) return NODE_ERROR;
    if (attribute < 0) {

        memcpy(pAttribute, address, sizeof(Attribute));
    }
    else {

#ifdef SCRIPT_IN_FLASH
        memcpy(pAttribute, flashMemory+(long)address, sizeof(Attribute));
#else
        ROM_Read((int)address, pAttribute, sizeof(Attribute));
#endif
    }
    return attribute;
}

NodeId fsd_fetchAttributeId(const NodeId attribute, const short offset)
{
    unsigned char*address;
    WORD word;
    address = fetchAttributePtr(attribute, offset);
    if (address == (void *)NODE_ERROR) return NODE_ERROR;
    if (attribute < 0) {

        memcpy(&word, address, sizeof(WORD));
    }
    else {

#ifdef SCRIPT_IN_FLASH
        memcpy(&word, flashMemory+(long)address, sizeof(WORD));
#else
        word = ROM_ReadWord((int)address);
#endif
    }
    return word;
}

TextLoc fsd_fetchNodeTextLoc(const NodeId node, const short offset)
{
    unsigned char *address;

```

```

WORD word;
address = fetchNodePtr(node, offset);
if (address == (void *)NODE_ERROR) return (TextLoc)NODE_ERROR;
if (node < 0) {

    memcpy(&word, address, 2);
}
else {

#ifdef SCRIPT_IN_FLASH
    memcpy(&word, flashMemory+(long)address, sizeof(WORD));
#else
    word = ROM_ReadWord((int)address);
#endif
}
return word;
}
TextLoc fsd_fetchAttributeTextLoc(const NodeId attribute, const short offset)
{
    unsigned char *address;
    WORD word;
    address = fetchAttributePtr(attribute, offset);
    if (address == (void *)NODE_ERROR) return (TextLoc)NODE_ERROR;
    if (attribute < 0) {

        memcpy(&word, address, 2);
    }
    else {

#ifdef SCRIPT_IN_FLASH
        memcpy(&word, flashMemory+(long)address, sizeof(WORD));
#else
        word = ROM_ReadWord((int)address);
#endif
    }
    return word;
}
void fsd_fetchText(TextLoc textLoc, short textLen, char *buffer, const short len)
{
    PtrTextLoc loc;
    short size;
    loc = fsd_fetchTextLocPtr(textLoc);
    if (loc == (PtrTextLoc)NODE_ERROR) {
        strcpy(buffer, EMPTY_STRING);
        return;
    }
    if (textLen >= len)
        size = len - 1;
    else
        size = textLen;

```

```

if (textLoc < 0) {

    strncpy(buffer, loc, size);
} else {

#ifdef SCRIPT_IN_FLASH
    strncpy(buffer, flashMemory+(long)loc, size);
#else
    ROM_Read((int)loc, buffer, (char)size);
#endif
}
buffer[size] = 0;
}

NodeId fsd_slotAttribute(void)
{
    short i;
    for (i=0; i < NUMDYNAMICATTRIBUTES; i++) {
        if (dynamicAttributes[i].parentnode == NODE_AVAILABLE ) {
            if (i > maxAttribute) {
                maxAttribute = i;
            }

            dynamicAttributes[i].parentnode = NODE_ALLOCATED;
            dynamicAttributes[i].locname = 0;
            dynamicAttributes[i].locvalue = 0;
            dynamicAttributes[i].nextattribute = NODE_EMPTY;
            return (NodeId) -(i + 2);
        }
    }
    return NODE_ERROR;
}

void fsd_scratchAttribute(const NodeId nodeId)
{
    PtrAttribute pAttrib;
    if (nodeId < 0 ) {
        pAttrib = fetchAttributePtr(nodeId,0);
        if (pAttrib == (PtrAttribute)NODE_ERROR) return;
        fsd_scratchTextBlock (pAttrib->locname);
        fsd_scratchTextBlock (pAttrib->locvalue);
        pAttrib->parentnode = NODE_AVAILABLE;
    }
}

NodeId fsd_slotNode(void)
{
    short i;
    for (i=0; i < NUMDYNAMICNODES; i++) {
        if (dynamicNodes[i].parentnode == NODE_AVAILABLE ) {
            if (i > maxNode) maxNode = i;
            dynamicNodes[i].typenode = NODE_ALLOCATED;
            dynamicNodes[i].firstattribute = NODE_EMPTY;
            dynamicNodes[i].firstchild = NODE_EMPTY;

```

```

dynamicNodes[i].locname = -1;
dynamicNodes[i].lenname = 0;
dynamicNodes[i].nextnode = NODE_EMPTY;
dynamicNodes[i].parentnode = NODE_EMPTY;
return (NodeId) -(i + 2);
}
}
return NODE_ERROR;
}

void fsd_scratchNode(const NodeId nodeId)
{
    PtrNode pNode;
    short pos;
    NodeId attrib;
    pos = 0;
    if (nodeId < 0 ) {
        pNode = fetchNodePtr(nodeId,0);
        if (pNode == (PtrNode)NODE_ERROR) return;

        while ((attrib = fsd_getAttributeByPos(nodeId, pos)) != NODE_ERROR) {
            fsd_scratchAttribute (attrib);
            pos++;
        }
        fsd_scratchTextBlock (pNode->locname);
        pNode->parentnode = NODE_AVAILABLE;
    }
}

TextLoc fsd_slotTextBlock(void)
{
    TextLoc loc=0;
    while (loc < SIZETEXTBUFFER && (loc + 1) < SIZETEXTBUFFER) {
        if (dynamicTextBuffer[loc] == 0 && dynamicTextBuffer[loc + 1] == 0) {
            if (loc > maxTextLoc) {
                maxTextLoc = loc;
            }
            dynamicTextBuffer[loc+1] = 1;
            return -(loc + 2);
        }
        loc += TEXT_CHUNK;
    }
    return TEXTLOC_EMPTY;
}

void fsd_scratchTextBlock(const TextLoc loc)
{
    PtrTextLoc pText;

    if (loc < 0) {
        pText = fsd_fetchTextLocPtr(loc);
        if (pText == (PtrTextLoc)NODE_ERROR) return;
        *pText++ = 0;
    }
}

```

```

        *pText = 0;
    }
}

short fsd_getAttributes(const NodeId parentNode, NodeId nodesFound[], const short len) {
    NodeId id;
    short cntNodesFound=0;
    id = fsd_fetchNodeId(parentNode, FIRSTATTRIBUTE);
    while (!(id == NODE_EMPTY || id == NODE_ERROR) ) {
        if (cntNodesFound >= len) return len;
        nodesFound[cntNodesFound] = id;
        cntNodesFound++;
        id = fsd_fetchAttributeld(id, NEXTATTRIBUTE);
    }
    return cntNodesFound;
}

void fsd_setNodeName(const NodeId node, const NodeId parent, const char *name)
{
    PtrNode pNode;
    PtrTextLoc pText;
    pNode = fetchNodePtr(node,0);

    pText = fsd_fetchTextLocPtr(pNode->locname);
    if (pText != (PtrTextLoc)NODE_ERROR) {
        fsd_scratchTextBlock(pNode->locname);
    }
    pNode->locname = fsd_addText(name);
    pNode->parentnode = parent;
    pNode->typenode = NODE_ELEMENT;
}

TextLoc fsd_addText(const char *sText)
{
    short slen;
    TextLoc loc;
    PtrTextLoc pText;
    slen = strlen(sText);
    if (slen == 0) return 0;

    if (slen > TEXT_CHUNK - 1 ) slen = TEXT_CHUNK - 1;
    loc = fsd_slotTextBlock();
    pText = fsd_fetchTextLocPtr(loc);
    if (pText == (PtrTextLoc)NODE_ERROR) {
        debugPutstrHi("addText err");
        return 0;
    }
    strncpy(pText,sText,slen);
    pText += slen;
    *pText = '\0';

    return loc;
}

```

```

NodeId fsd_getRootNode(void)
{
    NodeId id=0;
    while (!(id == NODE_EMPTY || id == NODE_ERROR)) {
        if (fsd_fetchNodeId(id,TYPENODE) == NODE_ELEMENT) {
            return id;
        }
        id = fsd_fetchNodeId(id, NEXTNODE);
    }
    return NODE_ERROR;
}

short fsd_getChildNodes(const NodeId parentNode, NodeId nodesFound[], const short len)
{
    NodeId id;
    short cntNodesFound=0;
    id = fsd_fetchNodeId(parentNode,FIRSTCHILD);
    while (!(id == NODE_EMPTY || id == NODE_ERROR)) {
        if (cntNodesFound >= len) return len;
        nodesFound[cntNodesFound] = id;
        cntNodesFound++;
        id = fsd_fetchNodeId(id, NEXTNODE);
    }
    return cntNodesFound;
}

NodeId fsd_getChildByPos(const NodeId parentNode, const short pos)
{
    NodeId id;
    short cnt=0;
    id = fsd_fetchNodeId(parentNode,FIRSTCHILD);
    while (!(id == NODE_EMPTY || id == NODE_ERROR) ) {
        if (cnt == pos) return id;
        cnt++;
        id = fsd_fetchNodeId(id, NEXTNODE);
    }
    return NODE_ERROR;
}

short fsd_getChildCount(const NodeId parentNode)
{
    NodeId id;
    short cntNodesFound=0;
    id = fsd_fetchNodeId(parentNode,FIRSTCHILD);
    while (!(id == NODE_EMPTY || id == NODE_ERROR) ) {
        cntNodesFound++;
        id = fsd_fetchNodeId(id, NEXTNODE);
    }
    return cntNodesFound;
}

void fsd_getNodeName(const NodeId nodeId, char *buffer, const short len)
{
    Node node;

```

```

NodeId id;
id = fsd_fetchNode(&node, nodeId);
if (id == NODE_ERROR) {
    strcpy(buffer, EMPTY_STRING);
}
else {
    fsd_fetchText(node.locname, node.lenname, buffer, len);
}
}
short fsd_getNodesByName(const NodeId parentNode, const char *sName, NodeId nodesFound[], const short len)
{
    NodeId id;
    short cntNodesFound=0;
    id = fsd_fetchNodeId(parentNode, FIRSTCHILD);
    while (!(id == NODE_EMPTY || id == NODE_ERROR) ) {
        fsd_getNodeName(id, TEMPBUFFER, CHAR_BUFFERSIZE);
        if (strcmp(TEMPBUFFER,sName) == 0) {
            nodesFound[cntNodesFound] = id;
            cntNodesFound++;
        }
        id = fsd_fetchNodeId(id, NEXTNODE);
    }
    return cntNodesFound;
}

```

```

NodeId fsd_getAttributeByName(const NodeId parentNode, const char *sName)
{
    NodeId id;

    Attribute attrib;
    char count;
    count = 0;
    id = fsd_fetchNodeId(parentNode, FIRSTATTRIBUTE);
    while (!(id == NODE_EMPTY || id == NODE_ERROR) ) {
        id = fsd_fetchAttribute(&attrib, id);
        if (id == NODE_ERROR) break;

        fsd_fetchText(attrib.locname, attrib.lenname, TEMPBUFFER, CHAR_BUFFERSIZE);
        if (strcmp(TEMPBUFFER,sName) == 0) {
            return id;
        }

        id = attrib.nextattribute;
        if (count++ > 100) break;
    }
    return NODE_ERROR;
}
short fsd_getAttributeCount(const NodeId parentNode)
{

```



```

    NodeId id;
short cnt=0;
    id = fsd_fetchNodeId(parentNode,FIRSTATTRIBUTE);
    while (!(id == NODE_EMPTY || id == NODE_ERROR)) {
cnt++;
        id = fsd_fetchAttributeld(id,NEXTATTRIBUTE);
    }
return cnt;
}
NodeId fsd_getAttributeByPos(const NodeId parentNode, const short pos)
{
    NodeId id;
short cnt=0;
    id = fsd_fetchNodeId(parentNode,FIRSTATTRIBUTE);
    while (!(id == NODE_EMPTY || id == NODE_ERROR)) {
if (cnt == pos) {
        return id;
    }
cnt++;
        id = fsd_fetchAttributeld(id,NEXTATTRIBUTE);
    }
return NODE_ERROR;
}
void fsd_getAttributeValue(const NodeId attributeld, char *buffer, const short len)
{
    Attribute attrib;
    NodeId id;

    id = fsd_fetchAttribute(&attrib, attributeld);
    if (id == NODE_ERROR) {
        strcpy(buffer, EMPTY_STRING);
        return;
    }

    fsd_fetchText(attrib.locvalue, attrib.lenvalue, buffer, len);
}
void fsd_getAttribute(const NodeId parentNode, const char *attribName, char *buffer, const short len)
{
    NodeId attribNode;
        attribNode = fsd_getAttributeByName(parentNode, attribName);
    if (attribNode == NODE_ERROR) {
        strcpy(buffer, EMPTY_STRING);
        return;
    }
    fsd_getAttributeValue(attribNode, buffer, len);
}
BOOL fsd_hasAttributes(const NodeId nodeld)
{

```

```

return fsd_fetchNodeId(nodeId, FIRSTATTRIBUTE) != NODE_EMPTY;
}
BOOL fsd_hasChildNodes(const NodeId nodeId)
{
return fsd_fetchNodeId(nodeId, FIRSTCHILD) != NODE_EMPTY;
}
NodeId fsd_setAttribute(const NodeId parentNode, const char *name, const char *value)
{
    NodeId attrId;
    NodeId attrParent;
    short attrCount;
    PtrAttribute pAttribute;
    PtrNode pNode;
    if ( parentNode >= 0 ) {
        return NODE_ERROR;
    }
    attrId = fsd_getAttributeByName(parentNode, name);
    if ( attrId != NODE_ERROR ) {
        pAttribute = fetchAttributePtr(attrId,0);
        if (pAttribute == (PtrAttribute)NODE_ERROR) return NODE_ERROR;

        fsd_scratchTextBlock (pAttribute->locvalue);

        pAttribute->locvalue = fsd_addText(value);
        pAttribute->lenvalue = (unsigned char)strlen(value);
        return attrId;
    }
    pNode = fetchNodePtr(parentNode,0);
    if (pNode == (PtrNode)NODE_ERROR) return NODE_ERROR;
    attrId = fsd_slotAttribute();
    if (attrId == NODE_ERROR) return NODE_ERROR;
    pAttribute = fetchAttributePtr(attrId,0);
    pAttribute->parentnode = parentNode;
    pAttribute->nextattribute = NODE_EMPTY;
    pAttribute->locname = fsd_addText(name);
    pAttribute->lenname = (unsigned char)strlen(name);
    pAttribute->locvalue = fsd_addText(value);
    pAttribute->lenvalue = (unsigned char)strlen(value);
    attrCount = fsd_getAttributeCount(parentNode);
    if ( attrCount == 0 ) {
        pNode->firstattribute = attrId;
    } else {
        attrParent = fsd_getAttributeByPos(parentNode, (const short)(attrCount - 1));
        pAttribute = fetchAttributePtr(attrParent, 0);
        if (pAttribute == (PtrAttribute)NODE_ERROR) return NODE_ERROR;
        pAttribute->nextattribute = attrId;
    }
    return attrId;
}
short fsd_getInteger(const char *value)

```

```

{

    return atoi(value);
}
static void readHeaderFlash(void)
{
    struct header_def *headerFrom;
    headerFrom = (struct header_def *) (flashMemory + scriptBuffer[currentScriptBuffer]);
    memcpy(&header[currentScriptBuffer], headerFrom, sizeof(struct header_def));
}
#ifdef SCRIPT_IN_FLASH
void fsd_moveScriptFlash(struct script_def *script, short numBytes)
{
    #ifdef PIC
    short count, sourceOffset, destOffset, chunk;
    int romAddress;
    unsigned long destAddress;
    char buffer[32];

    numBytes = (numBytes + 7) & 0xffff;

    count = 0;
    romAddress = script->location;
    destAddress = (unsigned long) flashMemory;

    sourceOffset = 0;
    destOffset = offsetFlashMemory;

    while(count < numBytes) {

        if ( count+32 < numBytes) {
            chunk = 32;
        }
        else {
            chunk = numBytes - count;
        }
        ROM_Read(romAddress+sourceOffset, buffer, chunk);
        TableWrite((unsigned char *) (destAddress+destOffset), buffer, chunk);
    }
}

```

```

count += chunk;
sourceOffset += chunk;
destOffset += chunk ;
}
#else

pc_moveScriptFlash(script, numBytes);
#endif
}
#endif
#ifdef PIC
static void readHeaderROM(unsigned char *address)
{
header[currentScriptBuffer].nodeOffset = ROM_ReadWord((int)address+0);
header[currentScriptBuffer].numNodes = ROM_ReadWord((int)address+2);
header[currentScriptBuffer].attributeOffset = ROM_ReadWord((int)address+4);
header[currentScriptBuffer].numAttributes = ROM_ReadWord((int)address+6);
header[currentScriptBuffer].textAreaOffset = ROM_ReadWord((int)address+8);
header[currentScriptBuffer].lenTextArea = ROM_ReadWord((int)address+10);
header[currentScriptBuffer].scriptType = ROM_ReadWord((int)address+12);
header[currentScriptBuffer].scriptId = ROM_ReadWord((int)address+14);
}
#endif
short fsd_findScript(short scriptType, short scriptId, struct script_def *script)
{
#ifdef PIC
unsigned char scriptFound;
short i, numScripts, scriptOrigin;

scriptOrigin = sizeof(struct control_def);
numScripts = ROM_ReadWord(NUMBERSSCRIPTS);
scriptFound = FALSE;

for (i=0; i < numScripts; i++) {
script->type = ROM_ReadWord(0 + (i * sizeof(struct script_def) + scriptOrigin) );
script->id = ROM_ReadWord(2 + (i * sizeof(struct script_def) + scriptOrigin) );
script->location = ROM_ReadWord(4 + (i * sizeof(struct script_def) + scriptOrigin) );

if (script->type != scriptType) continue;
if (scriptId != -1 && script->id != scriptId) continue;
readHeaderROM((unsigned char *)script->location);
scriptFound = TRUE;
break;
}
return scriptFound;
#else
return pc_findScript(scriptType, scriptId, script, &header[currentScriptBuffer]);
#endif

```

```

#endif
}
void fsd_setScriptBuffer(short scriptType, short scriptId)
{
#ifdef SCRIPT_IN_FLASH
    struct eprom_script_def epromScript;
    short numBytes;
#endif
    struct script_def script;
    short scriptFound;
    short saveScriptBuffer;
    if (!(numScriptBuffers < NUMSCRIPTS)) {
        errorBeep();
        debugPutstrHi("too many scripts");
        return;
    }

    saveScriptBuffer = currentScriptBuffer;
    currentScriptBuffer = numScriptBuffers;

    scriptFound = fsd_findScript(scriptType, scriptId, &script);
    if (scriptFound) {
        debug(("Script Found %d %d", script.type, script.id));
        scriptBuffer[currentScriptBuffer] = script.location;
        numScriptBuffers++;
        if (scriptType == IRSCRIPT) {
            irScriptBuffer = currentScriptBuffer;
        }

        if (scriptType == MAINSCRIPT) {
            mainScriptBuffer = currentScriptBuffer;
        }
    }
#ifdef SCRIPT_IN_FLASH

    numBytes = sizeof(struct header_def);
    numBytes += header[currentScriptBuffer].numNodes * sizeof(struct node_def);
    numBytes += header[currentScriptBuffer].numAttributes * sizeof(struct attribute_def);
    numBytes += header[currentScriptBuffer].lenTextArea;

    if ( (numBytes + offsetFlashMemory) < FLASHAREASIZE) {
        fsd_moveScriptFlash(&script, numBytes);
        scriptBuffer[currentScriptBuffer] = offsetFlashMemory;
        offsetFlashMemory += numBytes;

        epromScript.id = header[currentScriptBuffer].scriptId;
        epromScript.location = scriptBuffer[currentScriptBuffer];
        epromScript.type = header[currentScriptBuffer].scriptType;
        epromScript.len = numBytes;

```

```

    epromWriteScriptNumber(currentScriptBuffer, &epromScript);
}
#endif
}
else {
    currentScriptBuffer = saveScriptBuffer;

    if (scriptType == IRSCRIPT) {
        epromWriteWord(EPROM_IR_SCRIPTID, -1);
    }
    debug(("Script Type: %d Id: %d Not Found", scriptType, scriptId));
    errorBeep();
}
}
void fsd_setScriptBufferNoLoad(struct eprom_script_def *script)
{
    currentScriptBuffer = numScriptBuffers;
    numScriptBuffers++;
    offsetFlashMemory = script->location + script->len;
    if (script->type == IRSCRIPT) {
        irScriptBuffer = currentScriptBuffer;
    } else if (script->type == MAINSCRIPT) {
        mainScriptBuffer = currentScriptBuffer;
    }
    scriptBuffer[currentScriptBuffer] = script->location;
#ifdef !defined PIC && defined SCRIPT_IN_FLASH

    pc_readFlash(script->location, script->len);
#endif
    readHeaderFlash();
    debug(("RomScript %d %d %d %d", script->type, script->id, script->location, script->len));
}
void fsd_clearEpromScript(short scriptType, short scriptId)
{
    short i;
    struct eprom_script_def script;
    for (i = EPROM_NUM_SCRIPTS - 1; i > 0; i--) {
        epromGetScriptNumber(i, &script);
        if (script.type != -1) {
            epromInitializeScript(i);

            if (script.type != scriptType) continue;
            if (scriptId != -1 && script.id != scriptId) continue;
            numScriptBuffers--;
            break;
        }
    }
}
}

```

```
,  
' PushPlay -- An Xml Document emulator\interpreter for microprocessors  
' Copyright (C) 2002, Arthur Gravina. Confidential.  
' Arthur Gravina <art@agravina.com>  
,  
,
```

```
Attribute VB_Name = "FastSimpleDocument"  
Option Explicit  
Private Declare Sub CopyMemory Lib "kernel32" Alias _  
    "RtlMoveMemory" (dest As Any, source As Any, _  
        ByVal numBytes As Long)  
Public Const NODE_AVAILABLE = 0  
Public Const NODE_DYNAMIC = &HF00  
Public Const MAINSCRIPT = 1  
Public Const IRSCRIPT = 2  
Public header As header_def  
Public nodes() As node_def  
Public numNodes As Integer  
Public attributes() As attribute_def  
Public numAttributes As Integer  
Public textBuffer() As Byte  
Public nextTextLoc As Integer  
Public dynamicNodes(20) As node_def  
Public maxNode As Integer  
Public dynamicAttributes(60) As attribute_def  
Public maxAttribute As Integer  
Public dynamicTextBlocks(3200) As Byte  
Public maxTextBlock As Integer  
Public Const TEXT_CHUNK = 32  
Type header_def  
    nodeOffset As Integer  
    numNodes As Integer  
    attributeOffset As Integer  
    numAttributes As Integer  
    textAreaOffset As Integer  
    lenTextArea As Integer  
    scriptType As Integer  
    scriptId As Integer  
End Type  
Type node_def  
    parentNode As Integer  
    typeNode As Integer  
    nextNode As Integer  
    firstChild As Integer  
    firstAttribute As Integer  
    locName As Integer  
    lenName As Byte  
    filler As Byte  
End Type  
Type attribute_def
```

```

    parentNode As Integer
    nextAttribute As Integer
    locName As Integer
    locValue As Integer
    lenName As Byte
    lenValue As Byte
End Type

Function ByteArrayToString(byteArr() As Byte, StartIndex As Integer, length As Integer) As String
    Dim res As String
    res = Space(length)
    CopyMemory ByVal res, byteArr(StartIndex), length
    ByteArrayToString = res
End Function

Function StringToSingleBytes(source As String) As Byte()
    StringToSingleBytes = StrConv(source, vbFromUnicode)
End Function

Function isArrayEmpty(arr As Variant) As Boolean
    Dim i
    isArrayEmpty = True
    On Error Resume Next
    i = UBound(arr)
    If Err.Number > 0 Then Exit Function
    isArrayEmpty = False
End Function

Function fetchNode(nodeId As Integer) As node_def
    If nodeId < 0 Then
        fetchNode = dynamicNodes(Abs(nodeId) - 2)
    Else
        fetchNode = nodes(nodeId)
    End If
End Function

Sub saveNode(nodeId As Integer, node As node_def)
    If nodeId < 0 Then
        dynamicNodes(Abs(nodeId) - 2) = node
    Else
        MsgBox "saveNode Error: "
        nodes(nodeId) = node
    End If
End Sub

Function fetchAttribute(attributeId As Integer) As attribute_def
    If attributeId < 0 Then
        fetchAttribute = dynamicAttributes(Abs(attributeId) - 2)
    Else
        fetchAttribute = attributes(attributeId)
    End If
End Function

Sub saveAttribute(attributeId As Integer, attr As attribute_def)
    If attributeId < 0 Then
        dynamicAttributes(Abs(attributeId) - 2) = attr
    Else

```



```

        attributes(attributeld) = attr
    End If
End Sub
Function fsd_slotAttribute() As Integer
    Dim i
    On Error GoTo errrtn
tryagain:
    For i = 0 To UBound(dynamicAttributes)
        If dynamicAttributes(i).parentNode = NODE_AVAILABLE Then
            If i > maxAttribute Then maxAttribute = i
            dynamicAttributes(i).parentNode = NODE_DYNAMIC
            dynamicAttributes(i).locName = 0
            dynamicAttributes(i).locValue = 0
            dynamicAttributes(i).nextAttribute = -1
            fsd_slotAttribute = -(i + 2)
            Exit Function
        End If
    Next i
errrtn:
    fsd_slotAttribute = 0
End Function
Function fsd_slotTextBlock() As Integer
    Dim loc As Integer
    Do While loc < UBound(dynamicTextBlocks)
        If dynamicTextBlocks(loc) = 0 And dynamicTextBlocks(loc + 1) = 0 Then
            If loc > maxTextBlock Then maxTextBlock = loc
            fsd_slotTextBlock = -(loc + 2)
            Exit Function
        End If
        loc = loc + TEXT_CHUNK
    Loop
    fsd_slotTextBlock = 0
End Function
Function fsd_slotNode() As Integer
    Dim i As Integer
    On Error GoTo errrtn
tryagain:
    For i = 0 To UBound(dynamicNodes)
        If dynamicNodes(i).typeNode = NODE_AVAILABLE Then
            If i > maxNode Then maxNode = i
            dynamicNodes(i).typeNode = NODE_DYNAMIC
            dynamicNodes(i).firstAttribute = -1
            dynamicNodes(i).firstAttribute = -1
            dynamicNodes(i).locName = 0
            dynamicNodes(i).nextNode = -1
            dynamicNodes(i).parentNode = -1
            fsd_slotNode = -(i + 2)
            Exit Function
        End If
    Next i

```

```

errrtn:
    fsd_slotNode = 0
End Function
Sub fsd_scratchNode(nodeId As Integer)
    Dim attributeNodes() As Integer
    Dim i As Integer
    Dim node As node_def
    If Not nodeId < 0 Then
        MsgBox "scratchNode Error: Trying to scratch readonly"
        Exit Sub
    End If
    attributeNodes = fsd_getAttributes(nodeId)
    If Not isArrayEmpty(attributeNodes) Then
        For i = 0 To UBound(attributeNodes)
            fsd_scratchAttribute (attributeNodes(i))
        Next i
    End If
    node = fetchNode(nodeId)
    node.typeNode = NODE_AVAILABLE
    saveNode nodeId, node
End Sub
Function fsd_scratchAttribute(nodeId As Integer)
    Dim node As Integer
    node = Abs(nodeId) - 2
    If nodeId < 0 Then
        fsd_scratchTextBlock dynamicAttributes(node).locName
        fsd_scratchTextBlock dynamicAttributes(node).locValue
        dynamicAttributes(node).parentNode = NODE_AVAILABLE
    End If
End Function
Function fsd_scratchTextBlock(loc As Integer)
    Dim newLoc As Integer
    newLoc = Abs(loc) - 2
    If loc < 0 Then
        dynamicTextBlocks(newLoc) = 0
        dynamicTextBlocks(newLoc + 1) = 0
    End If
End Function
Sub fsd_initialize()
    numNodes = 0
    numAttributes = 0
    nextTextLoc = 0
    ReDim nodes(numNodes)
    ReDim attributes(numAttributes)
    ReDim textBuffer(nextTextLoc)
End Sub
Function fsd_addText(sText As String, Optional dynamicText As Boolean = False) As Integer
    Dim slen As Integer
    Dim loc As Integer
    Dim bt As Byte

```

```

Dim ba() As Byte
Dim i As Integer
Dim nextLoc As Integer
On Error GoTo errrtn
slen = Len(sText)
If slen = 0 Or slen > (TEXT_CHUNK - 2) Then
    fsd_addText = 0
    Exit Function
End If
loc = fsd_slotTextBlock()
If loc = 0 Then
    MsgBox "addText Failed. no more room"
    fsd_addText = 0
    Exit Function
End If
nextLoc = Abs(loc) - 2
ba = StringToSingleBytes(sText)
For i = 0 To slen - 1
    dynamicTextBlocks(nextLoc) = ba(i)
    nextLoc = nextLoc + 1
Next i
dynamicTextBlocks(nextLoc) = 0
nextLoc = nextLoc + 1
fsd_addText = loc
Exit Function
errrtn:
    MsgBox "Error: " & Err
    fsd_addText = 0
End Function
Function fsd_getText(locText As Integer) As String
    Dim start As Integer
    Dim slen As Integer
    Dim thisLoc As Integer
    If locText < 0 Then
        thisLoc = Abs(locText) - 2
        start = thisLoc
        Do While dynamicTextBlocks(start) <> 0
            slen = slen + 1
            start = start + 1
            If start > 1000 Then Exit Do
        Loop
        start = thisLoc
        fsd_getText = ByteArrayToString(dynamicTextBlocks, start, slen)
    Else
        start = locText
        Do While textBuffer(start) <> 0
            slen = slen + 1
            start = start + 1
            If start > 1000 Then Exit Do
        Loop
    End If

```

```

        start = locText
        fsd_getText = ByteArrayToString(textBuffer, start, slen)
    End If
End Function

Function fsd_getChildCount(nodeId As Integer) As Integer
    Dim id As Integer
    Dim cnt As Integer
    On Error GoTo errrtn
    id = fetchNode(nodeId).firstChild
    Do While id <> -1
        cnt = cnt + 1
        id = fetchNode(id).nextNode
    Loop
errrtn:
    fsd_getChildCount = cnt
End Function

Function fsd_getNthNode(nodeId As Integer, nodeNum As Integer) As Integer
    Dim id As Integer
    Dim cnt As Integer
    On Error GoTo errrtn
    id = fetchNode(nodeId).firstChild
    Do While id <> -1
        If cnt = nodeNum Then
            fsd_getNthNode = id
            Exit Function
        End If
        cnt = cnt + 1
        id = fetchNode(id).nextNode
    Loop
errrtn:
    fsd_getNthNode = id
End Function

Function fsd_hasChildNodes(nodeId As Integer) As Boolean
    On Error Resume Next
    fsd_hasChildNodes = fetchNode(nodeId).firstChild <> -1
End Function

Function fsd_getNodesByName(nodeId As Integer, sName As String) As Integer()
    Dim id As Integer
    Dim cnt As Integer
    Dim nodesFound() As Integer
    Dim cntNodesFound As Integer
    Dim sNodeName As String
    On Error GoTo errrtn
    id = fetchNode(nodeId).firstChild
    Do While id <> -1
        sNodeName = fsd_getText(fetchNode(id).locName)
        If sNodeName = sName Then
            ReDim Preserve nodesFound(cntNodesFound)
            nodesFound(cntNodesFound) = id
            cntNodesFound = cntNodesFound + 1
        End If
        id = fetchNode(id).nextNode
    Loop
errrtn:
    fsd_getNodesByName = nodesFound
End Function

```

```

        End If
        id = fetchNode(id).nextNode
    Loop
errrtn:
    fsd_getNodesByName = nodesFound
End Function
Function fsd_getAttributes(parentNode As Integer) As Integer()
    Dim id As Integer
    Dim cnt As Integer
    Dim nodesFound() As Integer
    Dim cntNodesFound As Integer
    Dim sNodeName As String
    On Error GoTo errrtn
    id = fetchNode(parentNode).firstAttribute
    Do While id <> -1
        ReDim Preserve nodesFound(cntNodesFound)
        nodesFound(cntNodesFound) = id
        cntNodesFound = cntNodesFound + 1
        id = fetchAttribute(id).nextAttribute
    Loop
errrtn:
    fsd_getAttributes = nodesFound
End Function
Function fsd_getChildNodes(nodeId As Integer) As Integer()
    Dim id As Integer
    Dim cnt As Integer
    Dim nodesFound() As Integer
    Dim cntNodesFound As Integer
    Dim sNodeName As String
    On Error GoTo errrtn
    id = fetchNode(nodeId).firstChild
    Do While id <> -1
        ReDim Preserve nodesFound(cntNodesFound)
        nodesFound(cntNodesFound) = id
        cntNodesFound = cntNodesFound + 1
        id = fetchNode(id).nextNode
    Loop
errrtn:
    fsd_getChildNodes = nodesFound
End Function
Public Function fsd_getRootNode() As Integer
    Dim id As Integer
    Do While id <> -1
        If fetchNode(id).typeNode = NODE_ELEMENT Then
            fsd_getRootNode = id
            Exit Function
        End If
        id = fetchNode(id).nextNode
    Loop
errrtn:

```

```

    fsd_getRootNode = 0
End Function
Function fsd_getNodeName(nodeId As Integer) As String
    fsd_getNodeName = fsd_getText(fetchNode(nodeId).locName)
End Function
Function fsd_getAttributeCount(nodeId As Integer) As Integer
    Dim id As Integer
    Dim cnt As Integer
    On Error GoTo errrtn
    id = fetchNode(nodeId).firstAttribute
    Do While id <> -1
        cnt = cnt + 1
        id = fetchAttribute(id).nextAttribute
    Loop
errrtn:
    fsd_getAttributeCount = cnt
End Function
Function fsd_getNthAttribute(nodeId As Integer, attributeNum As Integer) As Integer
    Dim id As Integer
    Dim cnt As Integer
    On Error GoTo errrtn
    id = fetchNode(nodeId).firstAttribute
    Do While id <> -1
        If cnt = attributeNum Then
            fsd_getNthAttribute = id
            Exit Function
        End If
        cnt = cnt + 1
        id = fetchAttribute(id).nextAttribute
    Loop
errrtn:
    fsd_getNthAttribute = id
End Function
Function fsd_getAttribute(nodeId As Integer, sName As String) As String
    Dim attributeld As Integer
    Dim sNull As String
    On Error Resume Next
    attributeld = fsd_getAttributeByName(nodeId, sName)
    If attributeld <> -1 Then
        fsd_getAttribute = fsd_getAttributeValue(attributeld)
    Else
        fsd_getAttribute = sNull
    End If
End Function
Function fsd_getAttributeByName(nodeId As Integer, sName As String) As Integer
    Dim id As Integer
    Dim cnt As Integer
    On Error GoTo errrtn
    id = fetchNode(nodeId).firstAttribute
    Do While id <> -1

```

```

    If sName = fsd_getAttributeName(id) Then
        fsd_getAttributeByName = id
        Exit Function
    End If
    cnt = cnt + 1
    id = fetchAttribute(id).nextAttribute
Loop
errrtn:
    fsd_getAttributeByName = -1
End Function
Function fsd_getAttributeName(nodeId As Integer) As String
    On Error GoTo errrtn
    fsd_getAttributeName = fsd_getText(fetchAttribute(nodeId).locName)
    Exit Function
errrtn:
    fsd_getAttributeName = Null
End Function
Function fsd_getAttributeValue(nodeId As Integer) As String
    On Error GoTo errrtn
    fsd_getAttributeValue = fsd_getText(fetchAttribute(nodeId).locValue)
    Exit Function
errrtn:
    fsd_getAttributeValue = Null
End Function
Function fsd_hasAttributes(nodeId As Integer) As Boolean
    On Error Resume Next
    fsd_hasAttributes = fetchNode(nodeId).firstAttribute <> -1
End Function
Sub fsd_readFile(filename As String)
    Dim i As Integer
    Open filename For Binary As #1
    Get #1, 1, header
    ReDim nodes(header.numNodes - 1)
    numNodes = header.numNodes
    Get #1, , nodes
    ReDim attributes(header.numAttributes - 1)
    numAttributes = header.numAttributes
    Get #1, , attributes
    ReDim textBuffer(header.lenTextArea - 1)
    Get #1, , textBuffer
    nextTextLoc = header.lenTextArea
    Close #1
End Sub
Function fsd_setAttribute(parentNode As Integer, name As String, value As String) As Integer
    Dim sName As String, sValue As String
    Dim attrId As Integer
    Dim parentAttrId As Integer, attrCount As Integer
    Dim node As node_def
    Dim localAttr As attribute_def
    On Error GoTo errrtn

```

```

If parentNode >= 0 Then
    fsd_setAttribute = -1
    Exit Function
End If
attrId = fsd_getAttributeByName(parentNode, name)
If attrId <> -1 Then
    localAttr = fetchAttribute(attrId)
    fsd_scratchTextBlock localAttr.locValue
    localAttr.locValue = -1
    localAttr.locValue = fsd_addText(value)
    saveAttribute attrId, localAttr
    fsd_setAttribute = attrId
    Exit Function
End If
attrId = fsd_slotAttribute()
localAttr = fetchAttribute(attrId)
localAttr.parentNode = parentNode
localAttr.nextAttribute = -1
localAttr.locName = fsd_addText(name)
localAttr.locValue = fsd_addText(value)
saveAttribute attrId, localAttr
fsd_setAttribute = attrId
attrCount = fsd_getAttributeCount(parentNode)
If attrCount = 0 Then
    node = fetchNode(parentNode)
    node.firstAttribute = attrId
    saveNode parentNode, node
Else
    parentAttrId = fsd_getNthAttribute(parentNode, attrCount - 1)
    localAttr = fetchAttribute(parentAttrId)
    localAttr.nextAttribute = attrId
    saveAttribute parentAttrId, localAttr
End If
Exit Function
errrtn:
End Function

```



```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */

```

```

#ifndef __DELAY_C
#define __DELAY_C
#include <pic18.h>
unsigned char delayus_variable;
#include "delay.h"
void DelayBigUs(unsigned int cnt)
{
    unsigned char i;
    i = (unsigned char)(cnt>>8);
    while(i>=1)
    {
        i--;
        DelayUs(253);
        CLRWDT();
    }
    DelayUs((unsigned char)(cnt & 0xFF));
}
void DelayMs(unsigned int cnt)
{
    unsigned char i;
    do {
        i = 4;
        do {
            DelayUs(250);
            CLRWDT();
        } while(--i);
    } while(--cnt);
}
void DelayS(unsigned char cnt)
{
    unsigned char i;
    do {
        i = 4;
        do {
            DelayMs(250);
            CLRWDT();
        } while(--i);
    } while(--cnt);
}
#endif

```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#include "squeue.h"
#define QUEUE_LENGTH QUEUE_DIM-1
#ifdef PIC
near
#endif
static int last=0;
#ifdef PIC
near
#endif
static int first=QUEUE_LENGTH;
static char val[QUEUE_DIM][MAXQUEUELENGTH];
char QueueIsFull(void)
{
    return (last>first ? last-first : QUEUE_DIM+last-first)>=QUEUE_DIM;
}
char QueueIsEmpty(void)
{
    return (last>first ? last-first : QUEUE_DIM+last-first) <= 1;
}
void EmptySQueue(void)
{
    last = 0;
    first = QUEUE_LENGTH;
}
void SEnqueue(const char *el)
{
    int slen;
    if (!QueueIsFull()) {
        slen = strlen(el);
        if (slen > (MAXQUEUELENGTH - 1))
            slen = MAXQUEUELENGTH - 1;
        strncpy(val[last],el, slen);
        val[last][slen] = 0;
        last++;
        if(last>=QUEUE_DIM) last-=QUEUE_DIM;
    }
    else {
        debugPutstrHi("SQueue Full");
    }
}
char SDequeue(char *el, const int len)

```

```
{
int slen;
if (!QueueIsEmpty()) {
if (++first>=QUEUE_DIM) first-=QUEUE_DIM;
slen = strlen(val[first]);
if (slen > (len - 1))
slen = len - 1;
strncpy(el, val[first], slen);
el[slen] = 0;
return 1;
}
return 0;
}
```

```

/*
 * PushPlay -- An Xml Document emulator\interpreter for microprocessors
 *
 * Copyright (C) 2002, Arthur Gravina. Confidential.
 *
 * Arthur Gravina <art@agravina.com>
 *
 */
#include "support.h"
#ifdef DEBUG
#include <pic18.h>
#include "config.h"
#include <stdio.h>
#include "serial.h"
void
init_comms(void)
{
    TRISC6=OUTPUT;
    TRISC7=INPUT;
    SPBRG= SPBRG_DIVIDER;
    BRGH=1;
    SYNC=0;
    SPEN=1;
    SREN=0;
    TXIE=0;
    RCIE=0;
    TX9=0;
    RX9=0;
    TXEN=0;
    TXEN=1;
    CREN=0;
    CREN=1;
}
void
putch(unsigned char byte)
{
    while(!TXIF)
        continue;
    TXREG = byte;
}
unsigned char
getch() {

    while(!RCIF)
        continue;
    return RCREG;
}
unsigned char
getche(void)

```

```

{
    unsigned char c;
    putchar(c = getch());
    return c;
}
char *getsNoEcho(char *s)
{
    register char *s1 = s;
    int c;
    for(;;) {
        switch(c = getch()) {
            case '\n':
            case '\r':
                *s1 = 0;
                return s;

            default:
                *s1++ = c;
                break;
        }
    }
}
char *gets(char *s)
{
    register char *s1 = s;
    int c;
    for(;;) {
        switch(c = getche()) {
            case '\n':
            case '\r':
                *s1 = 0;
                return s;

            default:
                *s1++ = c;
                break;
        }
    }
}
puts(const char *s)
{
    while(*s)
        putchar(*s++);
    putchar('\r');
    putchar('\n');
}
#endif

```

```

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 *
 */
#include "support.h"
#ifdef PIC
#include <pic18.h>
#include "delay.h"
#else
#include <stdio.h>
#endif
#include "beep.h"
#ifdef PIC
void beep( int frequency, int duration )
{
    long totalTime, freq;
    if( duration < 75 ) duration = 75;
    totalTime = (long)(duration * 1000L);

    if (frequency == 0) {
        DelayBigUs(totalTime);
        return;
    }
    if( frequency < c0) frequency = c0;

    freq = (long)(1000000L / (frequency * 2));
    di();
    while (totalTime > 0 ) {
        BEEPER = 1;
        DelayBigUs(freq);
        totalTime -= freq;
        BEEPER = 0;
        DelayBigUs(freq);
        totalTime -= freq;
    }
    ei();
}
#endif
void goodBeep(void)
{
#ifdef PIC
    beep (c1, EIGHTH);
    beep (g1, EIGHTH);
#else
    printf("goodBeep\a");
#endif
}

```

```
}  
void errorBeep(void)  
{  
    char i;  
    for (i=0; i < 3; i++) {  
#ifdef PIC  
        beep (c2, EIGHTH);  
        beep (e3, EIGHTH);  
        beep (g2, EIGHTH);  
        beep (c3, EIGHTH);  
#else  
        printf("errorBeep\\a");  
#endif  
    }  
}  
void keypressBeep(void)  
{  
#ifdef PIC  
    beep(c2, EIGHTH);  
#else  
    printf("\\a");  
#endif  
}
```